BETHLEHEM SHAPES

ARRANGED FOR USE IN DESIGNING

1930

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

BETHLEHEM SHAPES

ARRANGED IN THE ORDER OF DEPTHS AND STRENGTHS

FOR CONVENIENT USE

IN

DESIGNING

Catalogue No. S-35

BETHLEHEM STEEL EXPORT
CORPORATION
437 ST. JAMES STREET
MONTREAL

BETHLEHEM STEEL COMPANY

GENERAL OFFICES: BETHLEHEM, PA.

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BETHLEHEM STEEL COMPANY

INTRODUCTION.

This booklet provides information relating to Bethlehem Structural Shapes compactly arranged for use in designing, thus promoting ease of reference and ready selection of the most economical sections.

The first tables comprise the principal dimensions and properties of all Bethlehem shapes best adapted for use as beams, arranged substantially in the order of their flexural strengths.

Following this are tables of unit stresses to be used in designing centrally loaded columns for various usual ratios of length to least radius of gyration, these being based on the A. I. S. C. formula.

The last table herein shows the most economical Bethlehem shape when used as a beam in flexure corresponding to any required section modulus from 6.43 for the smallest 6-inch joist to 1103.6 for the largest 36-inch girder.

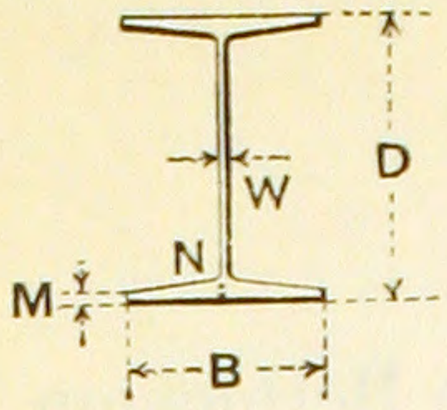
These tables provide all the usual information necessary in beam and column design.

In computing the weights and properties of all sections the fillets have been included.

The dimensions, areas, and weights presented herein are theoretical and subject to the usual variations.

Other information relating to Bethlehem Structural Shapes is shown in the following catalogues:- S-27, "BETHLEHEM STRUCTURAL SHAPES"; S-34, Supplement thereto; and S-28, "BETHLEHEM STEEL JOISTS AND STANCHIONS, ETC."

Standard structural shapes, including American Standard I Beams and Channels, Ship Channels, Equal and Unequal Angles, Bulb Angles, Z-Bars, and Car Building Shapes are shown in catalogue S-30, entitled "STANDARD STRUCTURAL SHAPES, ETC."



PROPERTIES OF
BETHLEHEM SHAPES
USED AS BEAMS

Section Number	Weight per Foot, Pounds	Nominal Depth of Beam, Inches D	Width of Flange, Inches B	THICKNESS IN INCHES			Area of Section, Square Inches	AXIS X-X		
				Web	Flange			Moment of Inertia, Inches^4	Radius of Gyration, Inches	Section Modulus, Inches^3
				W	M	N		I	r	S
G36 x 300.0		36.720	16.655	.945	1.353	2.007	88.12	20,262	15.16	1103.6
G36 x 280.0		36.500	16.600	.890	1.243	1.897	82.45	18,811	15.10	1030.8
G36 x 260.0		36.240	16.555	.845	1.113	1.767	76.50	17,205	15.00	949.5
G36 x 250.0		36.120	16.530	.820	1.053	1.707	73.61	16,457	14.95	911.2
G36 x 240.0		36.000	16.500	.790	.993	1.647	70.55	15,696	14.92	872.0
G36 x 230.0		35.880	16.475	.765	.933	1.587	67.67	14,960	14.87	833.9
B36 x 190.0		36.520	12.111	.726	1.035	1.509	55.87	12,049	14.68	659.9
B36 x 173.0		36.250	12.065	.680	.900	1.374	50.94	10,784	14.55	595.0
B36 x 164.0		36.120	12.030	.645	.835	1.309	48.10	10,133	14.51	561.1
B36 x 155.0		36.000	12.000	.615	.775	1.249	45.58	9547.4	14.47	530.4
B36 x 147.0		35.900	11.968	.583	.725	1.199	43.23	9036.3	14.46	503.4
G33 x 260.0		33.630	15.890	.875	1.237	1.863	76.54	14,868	13.94	884.2
G33 x 245.0		33.440	15.850	.835	1.142	1.768	72.19	13,895	13.87	831.0
G33 x 230.0		33.250	15.810	.795	1.047	1.673	67.85	12,935	13.81	778.0
G33 x 220.0		33.120	15.780	.765	.982	1.608	64.80	12,278	13.77	741.4
G33 x 210.0		33.000	15.750	.735	.922	1.548	61.91	11,671	13.73	707.3
G33 x 200.0		32.880	15.715	.700	.862	1.488	58.87	11,055	13.70	672.4
B33 x 165.0		33.500	11.350	.680	.968	1.412	48.52	8835.4	13.49	527.5
B33 x 152.0		33.270	11.312	.642	.853	1.297	44.65	7991.4	13.38	480.4
B33 x 143.0		33.120	11.285	.615	.778	1.222	42.05	7442.2	13.30	449.4
B33 x 135.0		33.000	11.250	.580	.718	1.162	39.55	6967.4	13.27	422.3
B33 x 125.0		32.890	11.205	.535	.663	1.107	36.83	6498.2	13.28	395.1

PROPERTIES OF
BETHLEHEM SHAPES
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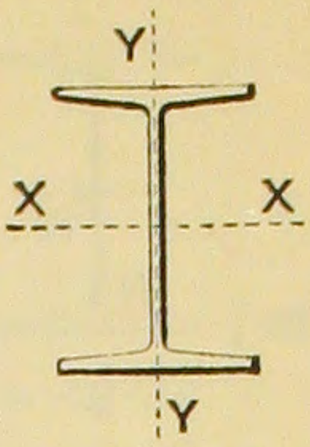
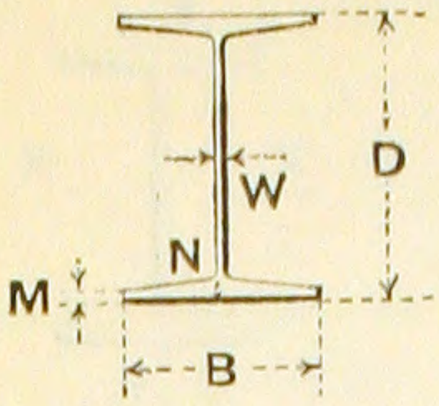


AXIS Y-Y			COEFFICIENTS OF STRENGTH IN FOOT POUNDS		MOMENTS OF RESISTANCE IN FOOT POUNDS		Maximum Safe Shear on Web in Pounds	Weight per Foot, Pounds
Moment of Inertia, Inches⁴ I′	Radius of Gyration, Inches r′	Section Modulus, Inches³ S′	For Fiber Stress of 18,000 Lbs. per Sq. In. C	For Fiber Stress of 16,000 Lbs. per Sq. In. C′	For Fiber Stress of 18,000 Lbs. per Sq. In. R	For Fiber Stress of 16,000 Lbs. per Sq. In. R′		
1177.7	3.66	141.4	13,240,000	11,770,000	1,655,000	1,472,000	334,800	300.0
1081.4	3.62	130.3	12,370,000	10,990,000	1,546,000	1,374,000	302,400	280.0
973.7	3.57	117.6	11,390,000	10,130,000	1,424,000	1,266,000	275,700	260.0
923.8	3.54	111.8	10,940,000	9,720,000	1,367,000	1,215,000	261,300	250.0
873.5	3.52	105.9	10,460,000	9,301,000	1,308,000	1,163,000	244,400	240.0
824.5	3.49	100.1	10,010,000	8,895,000	1,251,000	1,112,000	230,300	230.0
344.9	2.48	57.0	7,918,000	7,039,000	989,800	879,800	209,300	190.0
301.1	2.43	49.9	7,140,000	6,347,000	892,500	793,300	184,000	173.0
279.4	2.41	46.5	6,733,000	5,985,000	841,600	748,100	165,600	164.0
259.9	2.39	43.3	6,365,000	5,658,000	795,600	707,200	150,300	155.0
243.3	2.37	40.7	6,041,000	5,370,000	755,100	671,200	134,500	147.0
939.8	3.50	118.3	10,610,000	9,432,000	1,326,000	1,179,000	285,900	260.0
869.2	3.47	109.7	9,972,000	8,864,000	1,247,000	1,108,000	264,100	245.0
799.6	3.43	101.2	9,337,000	8,299,000	1,167,000	1,037,000	242,500	230.0
752.2	3.41	95.3	8,897,000	7,909,000	1,112,000	988,600	226,600	220.0
708.5	3.38	90.0	8,488,000	7,545,000	1,061,000	943,100	211,000	210.0
664.6	3.36	84.6	8,069,000	7,173,000	1,009,000	896,600	193,200	200.0
265.5	2.34	46.8	6,330,000	5,627,000	791,200	703,300	183,200	165.0
234.9	2.29	41.5	5,765,000	5,124,000	720,600	640,500	163,700	152.0
215.1	2.26	38.1	5,393,000	4,794,000	674,100	599,200	150,300	143.0
198.7	2.24	35.3	5,067,000	4,504,000	633,400	563,000	133,700	135.0
183.2	2.23	32.7	4,742,000	4,215,000	592,700	526,900	113,300	125.0



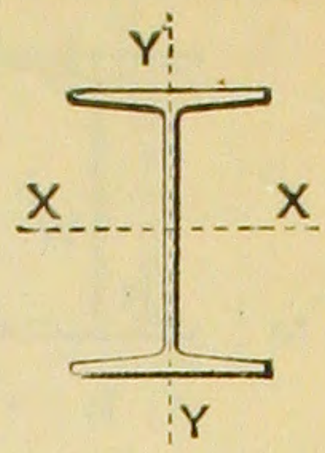
PROPERTIES OF
BETHLEHEM SHAPES
USED AS BEAMS

Section Number	Weight per Foot, Pounds	Nominal Depth of Beam, Inches D	Width of Flange, Inches B	THICKNESS IN INCHES: Web W	THICKNESS IN INCHES: Flange M	THICKNESS IN INCHES: Flange N	Area of Section, Square Inches	AXIS X-X: Moment of Inertia, Inches⁴ I	AXIS X-X: Radius of Gyration, Inches r	AXIS X-X: Section Modulus, Inches³ S
G30 x 240.0		30.750	15.200	.880	1.204	1.801	70.60	11,423	12.72	742.9
G30 x 220.0		30.500	15.135	.815	1.079	1.676	64.82	10,378	12.65	680.5
G30 x 200.0		30.250	15.065	.745	.954	1.551	58.92	9343.8	12.59	617.8
G30 x 190.0		30.120	15.030	.710	.889	1.486	55.90	8818.0	12.56	585.5
G30 x 180.0		30.000	15.000	.680	.829	1.426	53.20	8343.1	12.52	556.2
G30 x 173.0		29.880	14.980	.660	.769	1.366	50.80	7895.2	12.47	528.5
B30 x 163.0		30.650	10.680	.730	1.065	1.480	48.00	7270.7	12.31	474.4
B30 x 149.0		30.440	10.620	.670	.960	1.375	43.93	6606.6	12.26	434.1
B30 x 137.0		30.250	10.570	.620	.865	1.280	40.40	6026.7	12.21	398.5
B30 x 129.0		30.120	10.530	.580	.800	1.215	37.82	5622.7	12.19	373.4
B30 x 121.0		30.000	10.500	.550	.740	1.155	35.65	5269.7	12.16	351.3
B30 x 115.0		29.880	10.480	.530	.680	1.095	33.80	4942.9	12.09	330.8
B30 x 110.0		29.780	10.470	.520	.630	1.045	32.45	4687.7	12.02	314.8
G28 x 186.0		28.310	14.305	.730	.955	1.521	54.73	7604.0	11.79	537.2
G28 x 175.0		28.120	14.285	.710	.860	1.426	51.45	7026.0	11.69	499.7
G28 x 165.0		28.000	14.250	.675	.800	1.366	48.75	6624.6	11.66	473.2
G28 x 156.0		27.880	14.210	.635	.740	1.306	45.93	6218.6	11.64	446.1
G28 x 145.0		27.750	14.160	.585	.675	1.241	42.69	5772.3	11.63	416.0
B28 x 133.0		28.590	10.160	.630	.894	1.291	39.09	5204.0	11.54	364.0
B28 x 119.0		28.380	10.095	.565	.789	1.186	35.11	4647.4	11.50	327.5
B28 x 112.0		28.250	10.065	.535	.724	1.121	32.95	4328.0	11.46	306.4
B28 x 104.0		28.120	10.030	.500	.659	1.056	30.66	4003.3	11.43	284.7
B28 x 97.0		28.000	10.000	.470	.599	.996	28.61	3711.5	11.39	265.1
B28 x 91.0		27.880	9.980	.450	.539	.936	26.86	3441.1	11.32	246.9
B28 x 85.0		27.690	9.980	.450	.444	.841	24.96	3075.2	11.10	222.1
G26 x 160.0		26.120	13.790	.670	.845	1.392	47.25	5629.4	10.92	431.0
G26 x 151.0		26.000	13.750	.630	.785	1.332	44.55	5289.8	10.90	406.9
G26 x 144.0		25.880	13.730	.610	.725	1.272	42.38	4983.4	10.84	385.1
G26 x 138.0		25.810	13.700	.580	.690	1.237	40.65	4779.9	10.84	370.4
B26 x 98.0		26.120	9.530	.500	.665	1.042	28.69	3231.2	10.61	247.4
B26 x 91.0		26.000	9.500	.470	.605	.982	26.76	2993.1	10.58	230.2
B26 x 85.5		25.880	9.480	.450	.545	.922	25.11	2772.5	10.51	214.3
B26 x 81.0		25.780	9.470	.440	.495	.872	23.90	2600.1	10.43	201.7

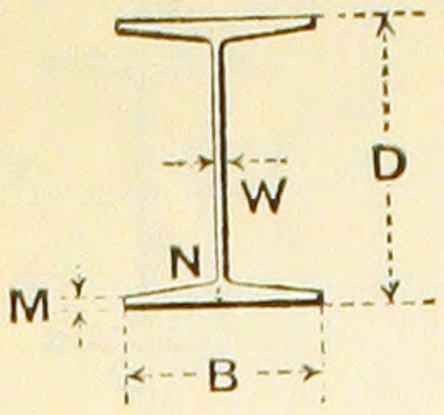
PROPERTIES OF

BETHLEHEM SHAPES

USED AS BEAMS



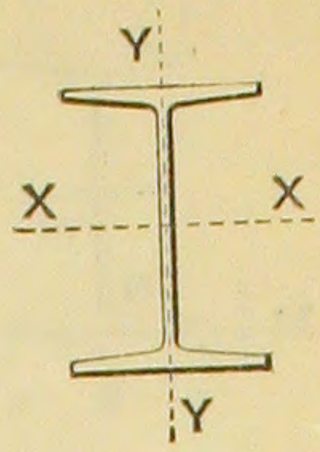
AXIS Y-Y			COEFFICIENTS OF STRENGTH IN FOOT POUNDS		MOMENTS OF RESISTANCE IN FOOT POUNDS		Maximum Safe Shear on Web, in Pounds	Weight per Foot, Pounds
Moment of Inertia Inches^4 **I′**	Radius of Gyration Inches **r′**	Section Modulus Inches^3 **S′**	For Fiber Stress of 18,000 Lbs. per Sq. In. **C**	For Fiber Stress of 16,000 Lbs. per Sq. In. **C′**	For Fiber Stress of 18,000 Lbs. per Sq. In. **R**	For Fiber Stress of 16,000 Lbs. per Sq. In. **R′**		
799.2	3.36	105.2	8,915,000	7,925,000	1,114,000	990,600	277,300	240.0
716.1	3.32	94.6	8,166,000	7,259,000	1,021,000	907,400	245,000	220.0
634.2	3.28	84.2	7,413,000	6,590,000	926,700	823,700	210,900	200.0
592.7	3.26	78.9	7,026,000	6,246,000	878,300	780,700	194,100	190.0
555.1	3.23	74.0	6,674,000	5,933,000	834,300	741,600	179,800	180.0
519.1	3.20	69.3	6,342,000	5,637,000	792,700	704,600	170,200	173.0
239.8	2.24	44.9	5,693,000	5,061,000	711,700	632,600	204,100	163.0
214.5	2.21	40.4	5,209,000	4,630,000	651,100	578,800	175,400	149.0
192.6	2.18	36.4	4,782,000	4,250,000	597,700	531,300	152,100	137.0
177.6	2.17	33.7	4,480,000	3,982,000	560,000	497,800	134,000	129.0
164.3	2.15	31.3	4,216,000	3,747,000	527,000	468,400	120,700	121.0
151.8	2.12	29.0	3,970,000	3,529,000	496,300	441,100	111,900	115.0
141.8	2.09	27.1	3,778,000	3,358,000	472,200	419,800	107,500	110.0
539.7	3.14	75.5	6,446,000	5,730,000	805,800	716,300	199,400	186.0
491.1	3.09	68.8	5,997,000	5,330,000	749,600	666,300	189,500	175.0
458.3	3.07	64.3	5,678,000	5,047,000	709,800	630,900	173,900	165.0
425.4	3.04	59.9	5,353,000	4,758,000	669,100	594,800	156,400	156.0
389.8	3.02	55.1	4,992,000	4,438,000	624,000	554,700	135,100	145.0
175.3	2.12	34.5	4,369,000	3,883,000	546,100	485,400	155,100	133.0
153.7	2.09	30.5	3,930,000	3,493,000	491,300	436,700	126,900	119.0
141.2	2.07	28.1	3,677,000	3,268,000	459,600	408,500	114,100	112.0
128.7	2.05	25.7	3,417,000	3,037,000	427,100	379,600	99,800	104.0
117.4	2.03	23.5	3,181,000	2,828,000	397,700	353,500	87,900	97.0
106.7	1.99	21.4	2,962,000	2,633,000	370,300	329,100	80,100	91.0
91.0	1.91	18.2	2,665,000	2,369,000	333,200	296,200	79,600	85.0
432.8	3.03	62.8	5,172,000	4,598,000	646,600	574,700	168,200	160.0
402.8	3.01	58.6	4,883,000	4,340,000	610,400	542,500	151,700	151.0
375.0	2.97	54.6	4,621,000	4,108,000	577,700	513,500	143,200	144.0
357.4	2.97	52.2	4,445,000	3,951,000	555,600	493,900	131,300	138.0
110.6	1.96	23.2	2,969,000	2,639,000	371,100	329,900	99,600	98.0
100.9	1.94	21.2	2,763,000	2,456,000	345,400	307,000	88,100	91.0
91.7	1.91	19.3	2,571,000	2,285,000	321,400	285,700	80,600	85.5
84.3	1.88	17.8	2,421,000	2,152,000	302,600	269,000	76,800	81.0



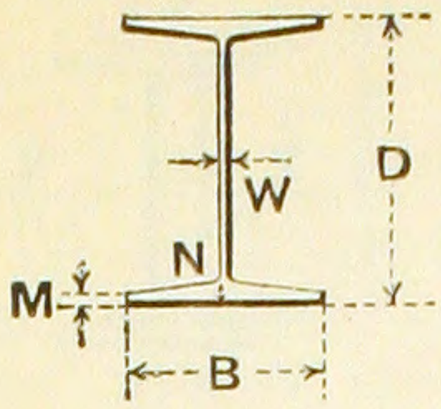
PROPERTIES OF
BETHLEHEM SHAPES
USED AS BEAMS

Section Number	Weight per Foot, Pounds	Nominal Depth of Beam, Inches D	Width of Flange, Inches B	THICKNESS IN INCHES			Area of Section, Square Inches	AXIS X-X		
				Web	Flange			Moment of Inertia, Inches⁴	Radius of Gyration, Inches	Section Modulus, Inches³
				W	M	N		I	r	S
G24a x	148.0	24.120	13.280	.640	.840	1.367	43.68	4478.0	10.13	371.3
G24a x	140.0	24.000	13.240	.600	.780	1.307	41.13	4201.3	10.11	350.1
G24a x	132.0	23.880	13.210	.570	.720	1.247	38.82	3939.6	10.07	329.9
G24 x	128.0	24.120	12.280	.570	.770	1.258	37.79	3867.1	10.12	320.7
G24 x	120.0	24.000	12.240	.530	.710	1.198	35.36	3607.8	10.10	300.6
G24 x	113.0	23.880	12.210	.500	.650	1.138	33.18	3363.3	10.07	281.7
G24 x	107.0	23.780	12.195	.485	.600	1.088	31.60	3173.1	10.02	266.9
B24b x	104.5	24.090	9.775	.550	.750	1.134	30.88	2997.3	9.85	248.8
B24b x	99.5	24.000	9.750	.525	.705	1.089	29.40	2841.3	9.83	236.8
B24b x	95.5	23.910	9.730	.505	.660	1.044	28.05	2692.7	9.80	225.2
B24a x	90.5	24.120	9.515	.475	.630	1.007	26.47	2588.2	9.89	214.6
B24a x	84.5	24.000	9.500	.460	.570	.947	24.97	2405.7	9.82	200.5
B24 x	79.5	24.090	9.035	.430	.565	.924	23.35	2266.7	9.85	188.2
B24 x	73.5	24.000	9.000	.395	.520	.879	21.70	2108.8	9.86	175.7
B24 x	70.0	23.880	9.000	.395	.460	.819	20.62	1954.1	9.74	163.7
G22 x	132.0	22.380	13.095	.575	.769	1.291	38.96	3501.2	9.48	312.9
G22 x	124.0	22.250	13.065	.545	.704	1.226	36.59	3261.7	9.44	293.2
G22 x	116.0	22.120	13.030	.510	.639	1.161	34.12	3021.2	9.41	273.2
G22 x	108.0	22.000	13.000	.480	.579	1.101	31.89	2804.3	9.38	254.9
G22 x	101.0	21.880	12.970	.450	.519	1.041	29.68	2590.4	9.34	236.8
B22a x	96.5	22.250	9.320	.525	.754	1.120	28.38	2373.7	9.15	213.4
B22a x	89.0	22.120	9.280	.485	.689	1.055	26.28	2188.6	9.13	197.9
B22a x	83.0	22.000	9.250	.455	.629	.995	24.51	2026.5	9.09	184.2
B22a x	77.0	21.880	9.220	.425	.569	.935	22.74	1866.7	9.06	170.6
B22 x	73.0	22.250	8.545	.415	.575	.913	21.51	1796.7	9.14	161.5
B22 x	67.5	22.120	8.520	.390	.510	.848	19.84	1637.5	9.08	148.1
B22 x	62.5	22.000	8.500	.370	.450	.788	18.38	1495.4	9.02	135.9
B22 x	58.0	21.880	8.490	.360	.390	.728	17.14	1363.9	8.92	124.7
B22 x	54.5	21.750	8.490	.360	.325	.663	16.04	1232.6	8.77	113.3

PROPERTIES OF
BETHLEHEM SHAPES
USED AS BEAMS



AXIS Y-Y			COEFFICIENTS OF STRENGTH IN FOOT POUNDS		MOMENTS OF RESISTANCE IN FOOT POUNDS		Maximum Safe Shear on Web, in Pounds	Weight per Foot, Pounds
Moment of Inertia, Inches^4 **I′**	Radius of Gyration, Inches **r′**	Section Modulus, Inches^3 **S′**	For Fiber Stress of 18,000 Lbs. per Sq. In. **C**	For Fiber Stress of 16,000 Lbs. per Sq. In. **C′**	For Fiber Stress of 18,000 Lbs. per Sq. In. **R**	For Fiber Stress of 16,000 Lbs. per Sq. In. **R′**		
382.5	2.96	57.6	4,456,000	3,961,000	557,000	495,100	151,900	148.0
355.6	2.94	53.7	4,201,000	3,735,000	525,200	466,800	136,600	140.0
329.9	2.92	50.0	3,959,000	3,519,000	494,900	439,900	125,100	132.0
277.5	2.71	45.2	3,848,000	3,420,000	481,000	427,500	125,500	128.0
256.3	2.69	41.9	3,608,000	3,207,000	451,000	400,900	110,500	120.0
236.1	2.67	38.7	3,380,000	3,005,000	422,500	375,600	99,400	113.0
220.0	2.64	36.1	3,202,000	2,847,000	400,300	355,800	93,700	107.0
132.9	2.07	27.2	2,986,000	2,654,000	373,300	331,800	117,300	104.5
124.9	2.06	25.6	2,841,000	2,526,000	355,200	315,700	107,900	99.5
117.1	2.04	24.1	2,703,000	2,402,000	337,900	300,300	100,500	95.5
104.9	1.99	22.1	2,575,000	2,289,000	321,900	286,100	89,800	90.5
95.8	1.96	20.2	2,406,000	2,138,000	300,700	267,300	84,200	84.5
81.2	1.87	18.0	2,258,000	2,007,000	282,300	250,900	73,900	79.5
74.7	1.86	16.6	2,109,000	1,875,000	263,600	234,300	62,200	73.5
67.4	1.81	15.0	1,964,000	1,746,000	245,500	218,200	61,900	70.0
339.3	2.95	51.8	3,755,000	3,337,000	469,300	417,200	124,500	132.0
312.6	2.92	47.9	3,518,000	3,127,000	439,800	390,900	113,700	124.0
286.0	2.90	43.9	3,278,000	2,914,000	409,700	364,200	101,400	116.0
261.9	2.87	40.3	3,059,000	2,719,000	382,400	339,900	91,000	108.0
238.1	2.83	36.7	2,841,000	2,526,000	355,200	315,700	80,800	101.0
115.1	2.01	24.7	2,560,000	2,276,000	320,100	284,500	106,200	96.5
104.8	2.00	22.6	2,375,000	2,111,000	296,800	263,800	92,400	89.0
95.8	1.98	20.7	2,211,000	1,965,000	276,300	245,600	82,200	83.0
87.0	1.96	18.9	2,048,000	1,820,000	255,900	227,500	72,200	77.0
69.1	1.79	16.2	1,938,000	1,723,000	242,300	215,300	69,000	73.0
61.8	1.76	14.5	1,777,000	1,579,000	222,100	197,400	60,800	67.5
55.2	1.73	13.0	1,631,000	1,450,000	203,900	181,300	54,500	62.5
48.9	1.69	11.5	1,496,000	1,330,000	187,000	166,200	51,300	58.0
42.2	1.62	9.95	1,360,000	1,209,000	170,000	151,100	51,000	54.5



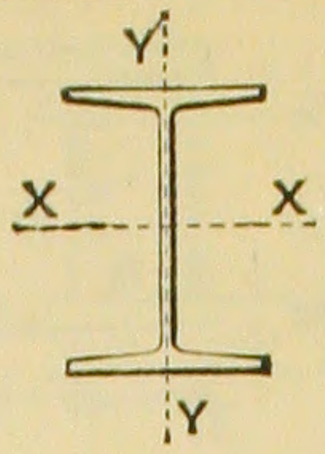
PROPERTIES OF
BETHLEHEM SHAPES
USED AS BEAMS

Section Number	Weight per Foot, Pounds	Nominal Depth of Beam, Inches D	Width of Flange, Inches B	THICKNESS IN INCHES			Area of Section, Square Inches	AXIS X-X		
				Web	Flange			Moment of Inertia, Inches^4	Radius of Gyration, Inches	Section Modulus, Inches^3
				W	M	N		I	r	S
G20a x	149.0	20.120	12.780	.690	.971	1.474	43.84	3134.9	8.46	311.6
G20a x	142.0	20.000	12.750	.660	.911	1.414	41.71	2960.6	8.43	296.1
G20a x	135.0	19.880	12.720	.630	.851	1.354	39.58	2788.9	8.39	280.6
G20a x	127.0	19.750	12.690	.600	.786	1.289	37.33	2607.3	8.36	264.0
G20 x	120.0	20.120	12.030	.590	.770	1.247	35.24	2528.0	8.47	251.3
G20 x	113.0	20.000	12.000	.560	.710	1.187	33.20	2362.8	8.44	236.3
G20 x	107.0	19.880	11.980	.540	.650	1.127	31.36	2206.5	8.39	222.0
G20 x	99.0	19.750	11.950	.510	.585	1.062	29.21	2034.4	8.35	206.0
B20a x	78.0	20.090	8.905	.460	.625	.977	22.98	1585.5	8.31	157.8
B20a x	73.0	20.000	8.875	.430	.580	.932	21.58	1485.0	8.30	148.5
B20a x	68.5	19.880	8.855	.410	.520	.872	20.12	1366.0	8.24	137.4
B20 x	64.5	20.120	8.025	.400	.545	.864	18.93	1295.1	8.27	128.7
B20 x	62.0	20.060	8.015	.390	.515	.834	18.25	1239.8	8.24	123.6
B20 x	59.5	20.000	8.000	.375	.485	.804	17.47	1181.5	8.22	118.2
B20 x	56.0	19.880	8.000	.375	.425	.744	16.51	1086.1	8.11	109.3
G18 x	99.0	18.250	11.795	.485	.649	1.120	29.11	1767.7	7.79	193.7
G18 x	92.0	18.120	11.770	.460	.584	1.055	27.13	1628.5	7.75	179.8
G18 x	86.0	18.000	11.750	.440	.524	.995	25.35	1503.6	7.70	167.1
G18 x	80.0	17.880	11.730	.420	.464	.935	23.59	1380.7	7.65	154.4
B18a x	74.0	18.120	8.770	.440	.645	.992	21.79	1249.2	7.57	137.9
B18a x	69.0	18.000	8.750	.420	.585	.932	20.37	1153.7	7.53	128.2
B18a x	64.5	17.880	8.730	.400	.525	.872	18.97	1059.7	7.47	118.5
B18a x	59.0	17.750	8.710	.380	.460	.807	17.48	960.3	7.41	108.2
B18 x	54.5	18.120	7.540	.370	.495	.794	16.06	896.1	7.47	98.9
B18 x	52.0	18.060	7.525	.355	.465	.764	15.34	851.7	7.45	94.3
B18 x	49.0	18.000	7.500	.330	.435	.734	14.44	802.8	7.46	89.2
B18 x	47.0	17.940	7.495	.325	.405	.704	13.90	764.1	7.42	85.2

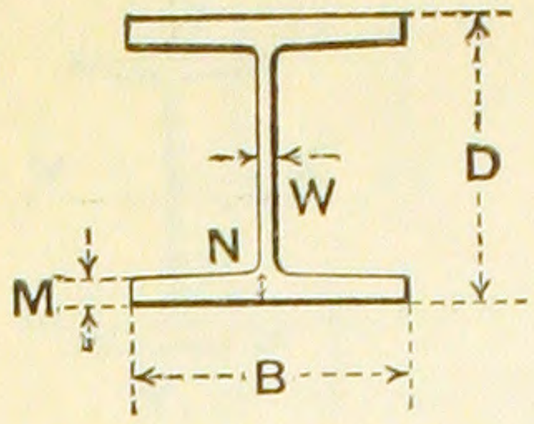
PROPERTIES OF

BETHLEHEM SHAPES

USED AS BEAMS



AXIS Y-Y			COEFFICIENTS OF STRENGTH IN FOOT POUNDS		MOMENTS OF RESISTANCE IN FOOT POUNDS		Maximum Safe Shear on Web, in Pounds	Weight per Foot, Pounds
Moment of Inertia, Inches^4 **I′**	Radius of Gyration, Inches **r′**	Section Modulus, Inches^3 **S′**	For Fiber Stress of 18,000 Lbs. per Sq. In. **C**	For Fiber Stress of 16,000 Lbs. per Sq. In. **C′**	For Fiber Stress of 18,000 Lbs. per Sq. In. **R**	For Fiber Stress of 16,000 Lbs. per Sq. In. **R′**		
384.6	2.96	60.2	3,739,000	3,324,000	467,400	415,500	155,400	149.0
361.0	2.94	56.6	3,553,000	3,158,000	444,100	394,700	145,400	142.0
337.7	2.92	53.1	3,367,000	2,993,000	420,900	374,100	135,500	135.0
313.0	2.90	49.3	3,168,000	2,816,000	396,000	352,000	125,700	127.0
260.2	2.72	43.3	3,015,000	2,680,000	376,900	335,100	123,500	120.0
240.8	2.69	40.1	2,835,000	2,520,000	354,400	315,000	113,700	113.0
222.4	2.66	37.1	2,664,000	2,368,000	333,000	296,000	106,900	107.0
202.1	2.63	33.8	2,472,000	2,197,000	309,000	274,700	97,300	99.0
84.7	1.92	19.0	1,894,000	1,684,000	236,800	210,500	82,200	78.0
78.5	1.91	17.7	1,782,000	1,584,000	222,700	198,000	72,900	73.0
71.0	1.88	16.0	1,649,000	1,466,000	206,100	183,200	66,600	68.5
54.3	1.69	13.5	1,545,000	1,373,000	193,100	171,600	63,700	64.5
51.5	1.68	12.9	1,483,000	1,318,000	185,400	164,800	60,700	62.0
48.6	1.67	12.2	1,418,000	1,260,000	177,200	157,500	56,200	59.5
43.5	1.62	10.9	1,311,000	1,166,000	163,900	145,700	55,900	56.0
211.3	2.69	35.8	2,325,000	2,066,000	290,600	258,300	87,700	99.0
192.2	2.66	32.7	2,157,000	1,917,000	269,600	239,700	80,200	92.0
174.9	2.63	29.8	2,005,000	1,782,000	250,600	222,800	74,200	86.0
157.8	2.59	26.9	1,853,000	1,647,000	231,700	205,900	68,300	80.0
82.9	1.95	18.9	1,655,000	1,471,000	206,800	183,800	74,300	74.0
75.6	1.93	17.3	1,538,000	1,367,000	192,300	170,900	68,400	69.0
68.4	1.90	15.7	1,422,000	1,264,000	177,800	158,000	62,600	64.5
60.7	1.86	13.9	1,298,000	1,154,000	162,300	144,300	56,900	59.0
41.1	1.60	10.9	1,187,000	1,055,000	148,400	131,900	54,300	54.5
38.7	1.59	10.3	1,132,000	1,006,000	141,500	125,800	50,200	52.0
36.1	1.58	9.64	1,070,000	951,500	133,800	118,900	43,700	49.0
34.0	1.56	9.06	1,022,000	908,600	127,800	113,600	42,300	47.0



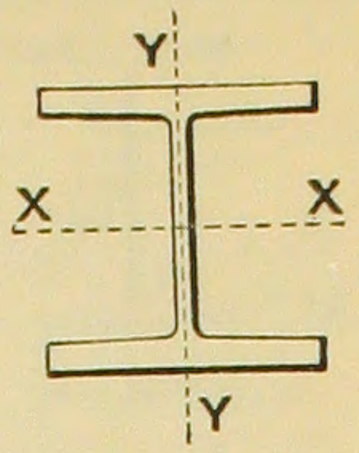
PROPERTIES OF BETHLEHEM SHAPES USED AS BEAMS

Section Number	Weight per Foot, Pounds	Nominal Depth of Beam, Inches D	Width of Flange, Inches B	THICKNESS IN INCHES			Area of Section, Square Inches	AXIS X-X		
				Web	Flange			Moment of Inertia, Inches⁴	Radius of Gyration, Inches	Section Modulus, Inches³
				W	M	N		I	r	S
H16	x 427.0	18.438	16.760	1.940	2.951	3.099	125.72	6416.2	7.14	696.0
H16	x 413.0	18.250	16.700	1.880	2.857	3.005	121.48	6121.5	7.10	670.8
H16	x 399.0	18.063	16.640	1.820	2.763	2.911	117.26	5834.0	7.05	646.0
H16	x 384.0	17.875	16.580	1.760	2.669	2.818	113.07	5553.6	7.01	621.4
H16	x 370.0	17.688	16.520	1.700	2.576	2.724	108.90	5280.2	6.96	597.1
H16	x 356.0	17.500	16.460	1.640	2.482	2.630	104.75	5013.7	6.92	573.0
H16b	x 363.0	17.313	16.760	1.940	2.388	2.536	106.86	4909.6	6.78	567.2
H16	x 342.0	17.313	16.400	1.580	2.388	2.536	100.63	4754.0	6.87	549.2
H16	x 328.0	17.125	16.340	1.520	2.294	2.443	96.53	4500.9	6.83	525.7
H16	x 314.0	16.938	16.280	1.460	2.201	2.349	92.45	4254.5	6.78	502.4
H16	x 301.0	16.750	16.230	1.410	2.107	2.255	88.56	4018.4	6.74	479.8
H16	x 288.0	16.563	16.180	1.360	2.013	2.161	84.69	3788.4	6.69	457.5
H16a	x 293.0	16.375	16.460	1.640	1.919	2.068	86.24	3685.1	6.54	450.1
H16	x 274.0	16.375	16.120	1.300	1.919	2.068	80.67	3560.7	6.64	434.9
H16	x 265.0	16.250	16.080	1.260	1.857	2.005	78.00	3412.4	6.61	420.0
H16	x 256.0	16.125	16.040	1.220	1.794	1.943	75.35	3266.7	6.58	405.2
H16	x 247.0	16.000	16.000	1.180	1.732	1.880	72.70	3123.7	6.55	390.5
H16	x 238.0	15.875	15.960	1.140	1.669	1.818	70.07	2983.4	6.53	375.9
H16	x 230.0	15.750	15.930	1.110	1.607	1.755	67.60	2848.9	6.49	361.8
H16	x 221.0	15.625	15.900	1.080	1.544	1.693	65.14	2716.9	6.46	347.8
H16	x 212.0	15.500	15.860	1.040	1.482	1.630	62.53	2584.1	6.43	333.4
H16	x 203.0	15.375	15.820	1.000	1.419	1.568	59.94	2453.9	6.40	319.2
H16	x 195.0	15.250	15.780	.960	1.357	1.505	57.35	2326.1	6.37	305.1
H16	x 186.0	15.125	15.740	.920	1.294	1.443	54.77	2200.9	6.34	291.0
H16	x 177.0	15.000	15.700	.880	1.232	1.380	52.20	2078.0	6.31	277.1
H16	x 169.0	14.875	15.660	.840	1.169	1.318	49.65	1957.6	6.28	263.2
H16	x 160.0	14.750	15.620	.800	1.107	1.255	47.10	1839.5	6.25	249.4
H16	x 151.0	14.625	15.580	.760	1.044	1.193	44.56	1723.8	6.22	235.7
H16	x 143.0	14.500	15.540	.720	.982	1.130	42.03	1610.4	6.19	222.1

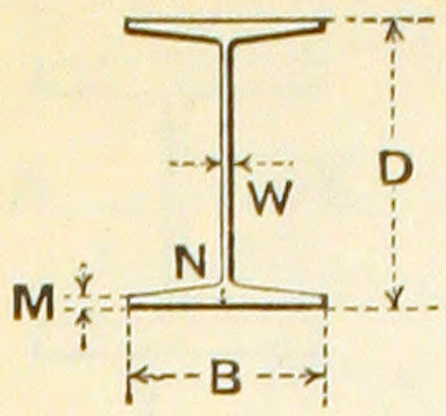
PROPERTIES OF

BETHLEHEM SHAPES

USED AS BEAMS



AXIS Y-Y			COEFFICIENTS OF STRENGTH IN FOOT POUNDS		MOMENTS OF RESISTANCE IN FOOT POUNDS		Maximum Safe Shear on Web, in Pounds	Weight per Foot, Pounds
Moment of Inertia, Inches⁴ I′	Radius of Gyration, Inches r′	Section Modulus, Inches³ S′	For Fiber Stress of 18,000 Lbs. per Sq. In. C	For Fiber Stress of 16,000 Lbs. per Sq. In. C′	For Fiber Stress of 18,000 Lbs. per Sq. In. R	For Fiber Stress of 16,000 Lbs. per Sq. In. R′		
2355.9	4.33	281.1	8,352,000	7,424,000	1,044,000	928,000	429,200	427.0
2257.2	4.31	270.3	8,050,000	7,156,000	1,006,000	894,500	411,700	413.0
2160.3	4.29	259.6	7,752,000	6,890,000	969,000	861,300	394,500	399.0
2065.1	4.27	249.1	7,457,000	6,628,000	932,100	828,500	377,500	384.0
1971.7	4.26	238.7	7,165,000	6,369,000	895,600	796,100	360,800	370.0
1880.0	4.24	228.4	6,876,000	6,112,000	859,500	764,000	344,400	356.0
1914.5	4.23	228.5	6,806,000	6,050,000	850,800	756,200	403,000	363.0
1790.1	4.22	218.3	6,590,000	5,858,000	823,800	732,300	328,200	342.0
1701.8	4.20	208.3	6,308,000	5,607,000	788,500	700,900	312,400	328.0
1615.2	4.18	198.4	6,028,000	5,359,000	753,600	669,800	296,700	314.0
1533.2	4.16	188.9	5,758,000	5,118,000	719,700	639,700	283,400	301.0
1452.5	4.14	179.5	5,490,000	4,880,000	686,200	610,000	270,300	288.0
1462.0	4.12	177.6	5,401,000	4,801,000	675,100	600,100	322,300	293.0
1370.6	4.12	170.0	5,219,000	4,639,000	652,300	579,900	255,500	274.0
1316.8	4.11	163.8	5,040,000	4,480,000	630,000	560,000	245,700	265.0
1263.8	4.10	157.6	4,862,000	4,322,000	607,800	540,200	236,100	256.0
1211.4	4.08	151.4	4,686,000	4,165,000	585,700	520,600	226,600	247.0
1159.8	4.07	145.3	4,510,000	4,009,000	563,800	501,100	217,200	238.0
1111.0	4.05	139.5	4,341,000	3,859,000	542,700	482,400	209,800	230.0
1062.7	4.04	133.7	4,173,000	3,709,000	521,600	463,700	202,500	221.0
1013.0	4.02	127.7	4,001,000	3,557,000	500,200	444,600	193,400	212.0
963.9	4.01	121.9	3,830,000	3,405,000	478,800	425,600	184,500	203.0
915.5	4.00	116.0	3,661,000	3,254,000	457,600	406,800	175,700	195.0
867.7	3.98	110.3	3,492,000	3,104,000	436,500	388,000	167,000	186.0
820.7	3.96	104.5	3,325,000	2,955,000	415,600	369,400	158,400	177.0
774.2	3.95	98.9	3,158,000	2,808,000	394,800	350,900	149,900	169.0
728.5	3.93	93.3	2,993,000	2,661,000	374,100	332,600	141,600	160.0
683.4	3.92	87.7	2,829,000	2,514,000	353,600	314,300	133,400	151.0
638.9	3.90	82.2	2,665,000	2,369,000	333,200	296,200	125,300	143.0



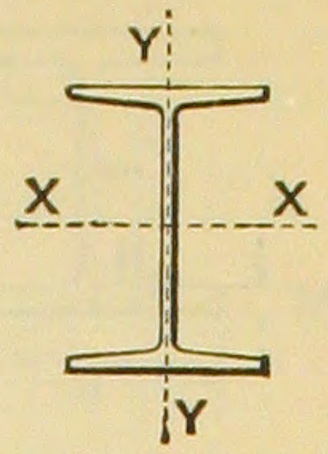
PROPERTIES OF BETHLEHEM SHAPES USED AS BEAMS

Section Number	Weight per Foot, Pounds	Nominal Depth of Beam, Inches	Width of Flange, Inches	THICKNESS IN INCHES			Area of Section, Square Inches	AXIS X-X		
				Web	Flange			Moment of Inertia, Inches^4	Radius of Gyration, Inches	Section Modulus, Inches^3
		D	B	W	M	N		I	r	S
G16	94.0	16.250	11.565	.485	.654	1.116	27.75	1341.4	6.95	165.1
G16	87.0	16.120	11.530	.450	.589	1.051	25.68	1230.8	6.92	152.7
G16	81.0	16.000	11.500	.420	.529	.991	23.82	1131.3	6.89	141.4
G16	74.5	15.880	11.470	.390	.469	.931	21.96	1033.6	6.86	130.2
B16a	71.5	16.250	8.565	.455	.664	1.001	21.07	973.5	6.80	119.8
B16a	66.0	16.120	8.530	.420	.599	.936	19.40	888.4	6.77	110.2
B16a	60.5	16.000	8.500	.390	.539	.876	17.89	812.1	6.74	101.5
B16a	56.5	15.880	8.485	.375	.479	.816	16.63	742.3	6.68	93.5
B16	50.0	16.250	7.320	.365	.483	.773	14.78	669.0	6.73	82.3
B16	45.0	16.120	7.285	.330	.418	.708	13.26	594.5	6.69	73.8
B16	40.0	16.000	7.250	.295	.358	.648	11.83	526.2	6.67	65.8
B16	35.0	15.810	7.240	.285	.263	.553	10.29	435.8	6.51	55.1
G15b	147.0	15.120	11.780	.830	1.150	1.606	43.30	1685.4	6.24	222.9
G15b	141.0	15.000	11.750	.800	1.090	1.546	41.44	1596.8	6.21	212.9
G15b	135.0	14.880	11.720	.770	1.030	1.486	39.58	1509.9	6.18	202.9
G15b	127.0	14.750	11.680	.730	.965	1.421	37.47	1415.6	6.15	191.9
G15a	111.0	15.120	11.290	.640	.845	1.289	32.75	1319.3	6.35	174.5
G15a	105.0	15.000	11.250	.600	.785	1.229	30.80	1231.3	6.32	164.2
G15a	99.0	14.880	11.220	.570	.725	1.169	29.00	1147.7	6.29	154.3
G15a	94.0	14.800	11.190	.540	.685	1.129	27.66	1090.2	6.28	147.3
G15	80.5	15.120	10.790	.480	.570	1.000	23.66	977.4	6.43	129.3
G15	74.0	15.000	10.750	.440	.510	.940	21.76	892.7	6.40	119.0
G15	69.0	14.880	10.730	.420	.450	.880	20.18	815.3	6.36	109.6
B15b	71.5	15.000	7.500	.520	.785	1.076	21.04	799.5	6.16	106.6
G15	64.5	14.820	10.700	.390	.420	.850	19.09	771.6	6.36	104.1
B15a	59.5	15.120	7.040	.450	.660	.935	17.49	676.2	6.22	89.4
B15a	54.5	15.000	7.000	.410	.600	.875	16.05	617.0	6.20	82.3
B15a	50.5	14.880	6.975	.385	.540	.815	14.84	563.3	6.16	75.7
B15a	46.0	14.750	6.955	.365	.475	.750	13.63	508.2	6.11	68.9
B15	42.5	15.090	6.785	.325	.445	.714	12.50	492.0	6.27	65.2
B15	40.0	15.030	6.765	.305	.415	.684	11.80	463.3	6.27	61.6
B15	38.5	15.000	6.750	.290	.400	.669	11.37	447.6	6.27	59.7
B15	36.0	14.910	6.740	.280	.355	.624	10.61	410.9	6.22	55.1

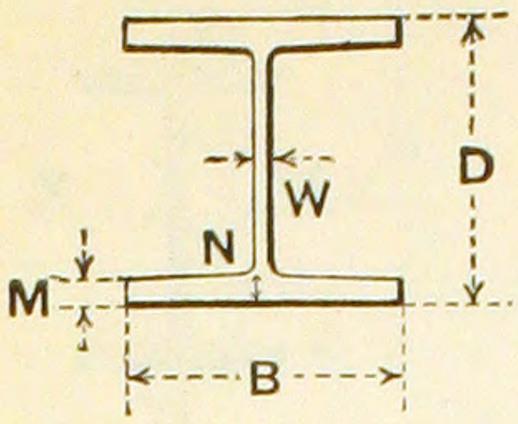
PROPERTIES OF

BETHLEHEM SHAPES

USED AS BEAMS



AXIS Y-Y			COEFFICIENTS OF STRENGTH IN FOOT POUNDS		MOMENTS OF RESISTANCE IN FOOT POUNDS		Maximum Safe Shear on Web, in Pounds	Weight per Foot, Pounds
Moment of Inertia, Inches^4 I′	Radius of Gyration, Inches r′	Section Modulus, Inches^3 S′	For Fiber Stress of 18,000 Lbs. per Sq. In. C	For Fiber Stress of 16,000 Lbs. per Sq. In. C′	For Fiber Stress of 18,000 Lbs. per Sq. In. R	For Fiber Stress of 16,000 Lbs. per Sq. In. R′		
199.9	2.68	34.6	1,981,000	1,761,000	247,600	220,100	83,200	94.0
181.3	2.66	31.5	1,832,000	1,629,000	229,000	203,600	74,000	87.0
164.6	2.63	28.6	1,697,000	1,508,000	212,100	188,500	66,200	81.0
148.1	2.60	25.8	1,562,000	1,389,000	195,300	173,600	58,400	74.5
79.0	1.94	18.4	1,438,000	1,278,000	179,700	159,800	75,200	71.5
71.2	1.92	16.7	1,323,000	1,176,000	165,300	147,000	66,100	66.0
64.3	1.90	15.1	1,218,000	1,083,000	152,300	135,400	58,300	60.5
57.8	1.86	13.6	1,122,000	997,200	140,200	124,700	54,300	56.5
36.6	1.57	10.01	988,100	878,300	123,500	109,800	52,000	50.0
31.9	1.55	8.75	885,100	786,700	110,600	98,340	43,200	45.0
27.6	1.53	7.61	789,200	701,500	98,660	87,690	34,900	40.0
21.4	1.44	5.92	661,500	588,000	82,680	73,500	32,200	35.0
347.5	2.83	59.0	2,675,000	2,378,000	334,400	297,200	150,600	147.0
328.5	2.82	55.9	2,555,000	2,271,000	319,400	283,900	144,000	141.0
309.7	2.80	52.9	2,435,000	2,165,000	304,400	270,600	137,500	135.0
289.1	2.78	49.5	2,303,000	2,047,000	287,900	255,900	129,200	127.0
231.3	2.66	41.0	2,094,000	1,862,000	261,800	232,700	115,800	111.0
214.4	2.64	38.1	1,970,000	1,751,000	246,300	218,900	106,100	105.0
198.5	2.62	35.4	1,851,000	1,645,000	231,400	205,700	98,600	99.0
187.4	2.60	33.5	1,768,000	1,571,000	221,000	196,400	91,400	94.0
143.1	2.46	26.5	1,551,000	1,379,000	193,900	172,400	78,400	80.5
128.9	2.43	24.0	1,428,000	1,270,000	178,500	158,700	68,700	74.0
115.8	2.40	21.6	1,315,000	1,169,000	164,400	146,100	63,700	69.0
60.9	1.70	16.2	1,279,000	1,137,000	159,900	142,100	87,500	71.5
108.6	2.39	20.3	1,250,000	1,111,000	156,200	138,800	56,700	64.5
42.8	1.56	12.2	1,073,000	954,100	134,200	119,300	71,300	59.5
38.6	1.55	11.0	987,300	877,600	123,400	109,700	61,600	54.5
34.7	1.53	9.96	908,600	807,600	113,600	101,000	55,400	50.5
30.8	1.50	8.85	826,900	735,000	103,400	91,880	50,500	46.0
26.9	1.47	7.93	782,500	695,500	97,810	86,940	41,700	42.5
25.1	1.46	7.42	739,700	657,500	92,470	82,190	37,100	40.0
24.1	1.46	7.15	716,100	636,600	89,520	79,570	33,800	38.5
21.7	1.43	6.45	661,400	587,900	82,670	73,480	31,400	36.0



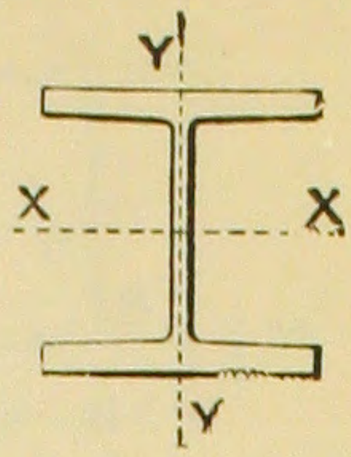
PROPERTIES OF
BETHLEHEM SHAPES
USED AS BEAMS

Section Number	Weight per Foot, Pounds	Nominal Depth of Beam, Inches D	Width of Flange, Inches B	Thickness in Inches: Web W	Thickness in Inches: Flange M	Thickness in Inches: Flange N	Area of Section, Square Inches	Axis X-X: Moment of Inertia, Inches⁴ I	Axis X-X: Radius of Gyration, Inches r	Axis X-X: Section Modulus, Inches³ S
H14	x 298.0	16.875	15.610	1.390	2.175	2.317	87.63	4011.3	6.77	475.4
H14	x 289.0	16.750	15.570	1.350	2.112	2.255	85.01	3857.7	6.74	460.6
H14	x 280.0	16.625	15.530	1.310	2.050	2.192	82.39	3706.9	6.71	445.9
H14	x 271.0	16.500	15.490	1.270	1.987	2.130	79.79	3558.8	6.68	431.4
H14	x 262.0	16.375	15.450	1.230	1.925	2.067	77.20	3413.4	6.65	416.9
H14	x 254.0	16.250	15.410	1.190	1.862	2.005	74.62	3270.6	6.62	402.5
H14	x 245.0	16.125	15.370	1.150	1.800	1.942	72.05	3130.4	6.59	388.3
H14	x 236.0	16.000	15.330	1.110	1.737	1.880	69.49	2992.9	6.56	374.1
H14	x 227.0	15.875	15.290	1.070	1.675	1.817	66.94	2857.8	6.53	360.0
H14	x 219.0	15.750	15.250	1.030	1.612	1.755	64.40	2725.3	6.51	346.1
H14	x 210.0	15.625	15.210	.990	1.550	1.692	61.86	2595.4	6.48	332.2
H14	x 202.0	15.500	15.180	.960	1.487	1.630	59.50	2470.9	6.44	318.8
H14	x 194.0	15.375	15.140	.920	1.425	1.567	56.99	2345.8	6.42	305.1
H14	x 185.0	15.250	15.100	.880	1.362	1.505	54.48	2223.0	6.39	291.5
H14	x 177.0	15.125	15.060	.840	1.300	1.442	51.99	2102.6	6.36	278.0
H14	x 168.0	15.000	15.020	.800	1.237	1.380	49.51	1984.6	6.33	264.6
H14	x 161.0	14.875	15.000	.780	1.175	1.317	47.33	1874.4	6.29	252.0
H14	x 155.0	14.875	14.270	.780	1.183	1.317	45.62	1793.8	6.27	241.2
H14	x 147.0	14.750	14.230	.740	1.120	1.255	43.25	1685.3	6.24	228.5
H14	x 139.0	14.625	14.190	.700	1.058	1.192	40.88	1578.9	6.21	215.9
H14	x 131.5	14.500	14.160	.670	.995	1.130	38.68	1477.3	6.18	203.8
H14b	x 149.0	14.125	14.900	1.410	.808	.942	43.82	1379.1	5.61	195.3
H14	x 123.5	14.375	14.120	.630	.933	1.067	36.33	1375.1	6.15	191.3
H14	x 115.5	14.250	14.080	.590	.870	1.005	34.00	1275.1	6.12	179.0
H14	x 107.5	14.125	14.040	.550	.808	.942	31.67	1177.2	6.10	166.7
H14	x 100.0	14.000	14.000	.510	.745	.880	29.36	1081.2	6.07	154.5
H14	x 92.0	13.875	13.960	.470	.683	.817	27.05	987.4	6.04	142.3

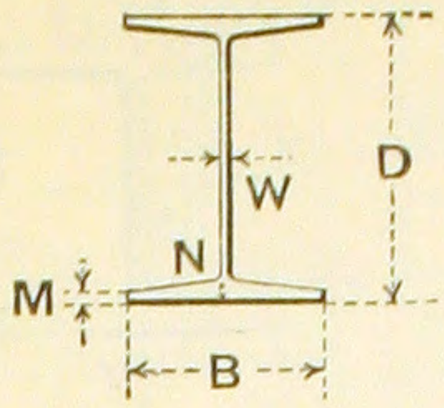
PROPERTIES OF

BETHLEHEM SHAPES

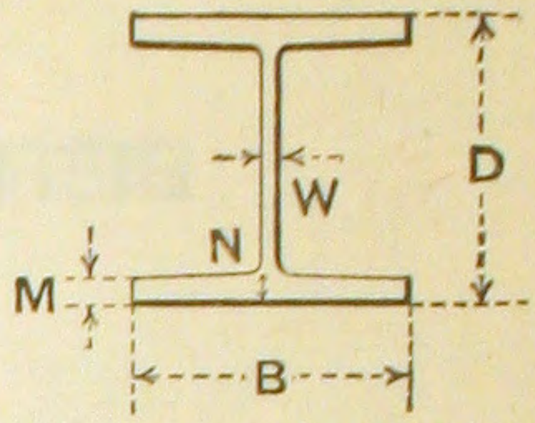
USED AS BEAMS



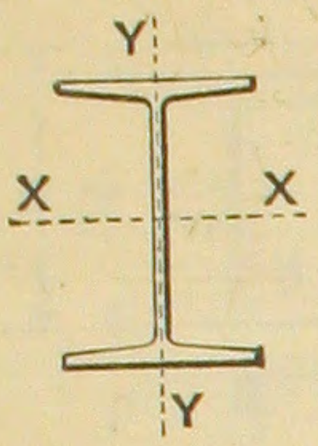
AXIS Y-Y			COEFFICIENTS OF STRENGTH IN FOOT POUNDS		MOMENTS OF RESISTANCE IN FOOT POUNDS		Maximum Safe Shear on Web, in Pounds	Weight per Foot, Pounds
Moment of Inertia, Inches^4 **I′**	Radius of Gyration, Inches **r′**	Section Modulus, Inches^3 **S′**	For Fiber Stress of 18,000 Lbs. per Sq. In. **C**	For Fiber Stress of 16,000 Lbs. per Sq. In. **C′**	For Fiber Stress of 18,000 Lbs. per Sq. In. **R**	For Fiber Stress of 16,000 Lbs. per Sq. In. **R′**		
1406.5	4.01	180.2	5,705,000	5,071,000	713,100	633,900	281,500	298.0
1356.1	3.99	174.2	5,527,000	4,913,000	690,900	614,200	271,400	289.0
1306.4	3.98	168.2	5,351,000	4,757,000	668,900	594,600	261,300	280.0
1257.3	3.97	162.3	5,176,000	4,601,000	647,100	575,200	251,500	271.0
1209.0	3.96	156.5	5,003,000	4,447,000	625,400	555,900	241,700	262.0
1161.2	3.94	150.7	4,830,000	4,294,000	603,800	536,700	232,100	254.0
1114.2	3.93	145.0	4,659,000	4,142,000	582,400	517,700	222,500	245.0
1067.8	3.92	139.3	4,489,000	3,990,000	561,200	498,800	213,100	236.0
1022.0	3.91	133.7	4,321,000	3,840,000	540,100	480,100	203,800	227.0
976.9	3.89	128.1	4,153,000	3,691,000	519,100	461,400	194,700	219.0
932.4	3.88	122.6	3,986,000	3,544,000	498,300	442,900	185,600	210.0
890.3	3.87	117.3	3,826,000	3,401,000	478,200	425,100	178,600	202.0
846.9	3.86	111.9	3,662,000	3,255,000	457,700	406,900	169,700	194.0
804.2	3.84	106.5	3,498,000	3,110,000	437,300	388,700	161,000	185.0
762.1	3.83	101.2	3,336,000	2,966,000	417,000	370,700	152,500	177.0
720.6	3.82	96.0	3,175,000	2,823,000	396,900	352,800	144,000	168.0
682.5	3.80	91.0	3,024,000	2,688,000	378,000	336,000	139,200	161.0
590.6	3.60	82.8	2,894,000	2,573,000	361,800	321,600	139,200	155.0
555.5	3.58	78.1	2,742,000	2,438,000	342,800	304,700	131,000	147.0
520.9	3.57	73.4	2,591,000	2,303,000	323,900	287,900	122,900	139.0
488.0	3.55	68.9	2,445,000	2,173,000	305,600	271,700	116,600	131.5
468.8	3.27	62.9	2,343,000	2,083,000	292,900	260,400	239,000	149.0
454.4	3.54	64.4	2,296,000	2,041,000	287,000	255,100	108,600	123.5
421.4	3.52	59.9	2,148,000	1,909,000	268,400	238,600	99,260	115.5
388.9	3.50	55.4	2,000,000	1,778,000	250,000	222,200	90,020	107.5
356.9	3.49	51.0	1,854,000	1,648,000	231,700	206,000	80,860	100.0
325.5	3.47	46.6	1,708,000	1,518,000	213,500	189,800	71,800	92.0



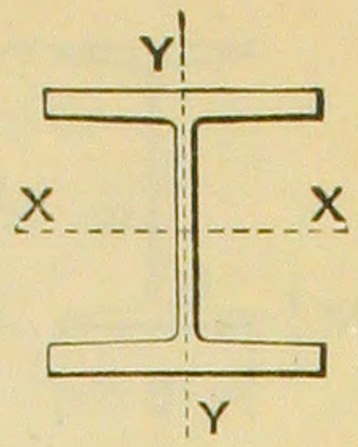
PROPERTIES OF BETHLEHEM SHAPES USED AS BEAMS



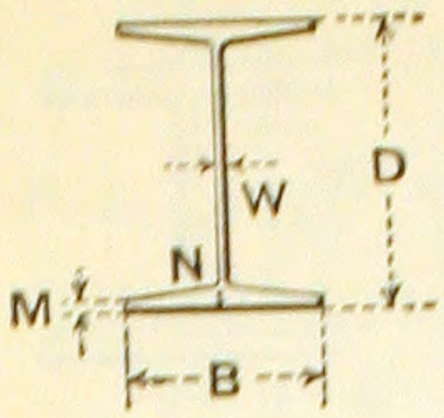
Section Number	Weight per Foot, Pounds	Nominal Depth of Beam, Inches D	Width of Flange, Inches B	THICKNESS IN INCHES: Web W	THICKNESS IN INCHES: Flange M	THICKNESS IN INCHES: Flange N	Area of Section, Square Inches	AXIS X-X: Moment of Inertia, Inches⁴ I	AXIS X-X: Radius of Gyration, Inches r	AXIS X-X: Section Modulus, Inches³ S
H 14 14 x	90.0	14.000	12.120	.510	.764	.880	26.52	956.7	6.01	136.7
H14 x	84.0	13.750	13.920	.430	.620	.755	24.76	895.5	6.01	130.2
H 14 14 x	83.0	13.875	12.080	.470	.701	.817	24.45	874.2	5.98	126.0
H 14 14 x	76.0	13.750	12.040	.430	.639	.755	22.39	793.5	5.95	115.4
H 14 10 x	73.5	13.875	10.120	.470	.721	.817	21.66	753.3	5.90	108.6
H 14 12 x	69.0	13.625	12.000	.390	.576	.692	20.34	714.6	5.93	104.9
H 14 10 x	67.5	13.750	10.080	.430	.658	.755	19.85	684.3	5.87	99.5
H 14 10 x	61.5	13.625	10.040	.390	.596	.692	18.04	616.9	5.85	90.6
H 14 8 x	58.5	13.750	8.120	.430	.678	.755	17.23	572.2	5.76	83.2
H 14 10 x	55.0	13.500	10.000	.350	.533	.630	16.25	551.0	5.82	81.6
H 14 8 x	53.5	13.625	8.080	.390	.616	.692	15.67	516.2	5.74	75.8
H 14 8 x	48.0	13.500	8.040	.350	.553	.630	14.12	461.5	5.72	68.4
B14 x	42.0	14.250	6.825	.340	.443	.713	12.46	436.5	5.92	61.3
H 14 8 x	43.0	13.375	8.000	.310	.491	.567	12.58	408.2	5.70	61.0
B14 x	37.5	14.120	6.790	.305	.378	.648	11.07	383.7	5.89	54.3
B14 x	33.0	14.000	6.750	.265	.318	.588	9.70	334.3	5.87	47.8
B14 x	30.0	13.880	6.750	.265	.258	.528	8.89	294.9	5.76	42.5



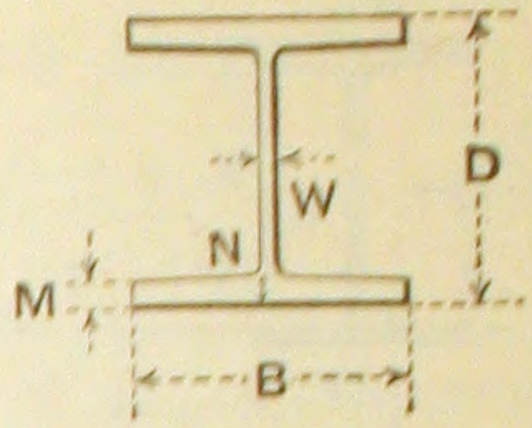
PROPERTIES OF BETHLEHEM SHAPES USED AS BEAMS



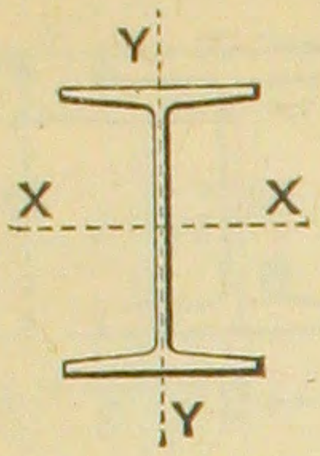
AXIS Y-Y			COEFFICIENTS OF STRENGTH IN FOOT POUNDS		MOMENTS OF RESISTANCE IN FOOT POUNDS		Maximum Safe Shear on Web, in Pounds	Weight per Foot, Pounds
Moment of Inertia, Inches^4 I′	Radius of Gyration, Inches r′	Section Modulus, Inches^3 S′	For Fiber Stress of 18,000 Lbs. per Sq. In. C	For Fiber Stress of 16,000 Lbs. per Sq. In. C′	For Fiber Stress of 18,000 Lbs. per Sq. In. R	For Fiber Stress of 16,000 Lbs. per Sq. In. R′		
235.8	2.98	38.9	1,640,000	1,458,000	205,000	182,200	80,860	90.0
294.5	3.45	42.3	1,563,000	1,389,000	195,400	173,700	62,840	84.0
215.1	2.97	35.6	1,512,000	1,344,000	189,000	168,000	71,800	83.0
194.7	2.95	32.3	1,385,000	1,231,000	173,100	153,900	62,840	76.0
129.1	2.44	25.5	1,303,000	1,158,000	162,900	144,800	71,800	73.5
174.7	2.93	29.1	1,259,000	1,119,000	157,300	139,900	54,000	69.0
116.8	2.43	23.2	1,194,000	1,062,000	149,300	132,700	62,850	67.5
104.8	2.41	20.9	1,087,000	965,900	135,800	120,700	54,000	61.5
62.4	1.90	15.4	998,700	887,700	124,800	111,000	62,850	58.5
93.1	2.39	18.6	979,500	870,700	122,400	108,800	45,310	55.0
56.0	1.89	13.9	909,200	808,200	113,700	101,000	54,000	53 5
49.7	1.88	12.4	820,500	729,300	102,600	91,170	45,310	48.0
27.3	1.48	8.00	735,200	653,500	91,900	81,690	44,400	42.0
43.6	1.86	10.9	732,500	651,100	91,560	81,380	36,830	43.0
23.4	1.46	6.91	652,200	579,700	81,520	72,460	36,600	37.5
19.9	1.43	5.90	573,000	509,400	71,630	63,670	28,100	33.0
16.9	1.38	4.99	510,000	453,300	63,740	56,660	27,900	30.0



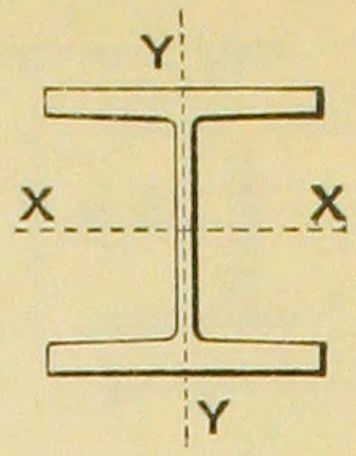
PROPERTIES OF BETHLEHEM SHAPES USED AS BEAMS



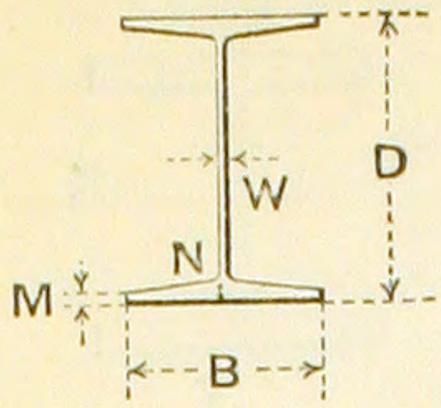
Section Number	Weight per Foot, Pounds	Nominal Depth of Beam, Inches D	Width of Flange, Inches B	THICKNESS IN INCHES: Web W	Flange M	Flange N	Area of Section, Square Inches	AXIS X-X: Moment of Inertia, Inches⁴ I	Radius of Gyration, Inches r	Section Modulus, Inches³ S
H12	x 190.0	14.000	12.620	1.090	1.692	1.808	55.91	1780.9	5.64	254.4
H12	x 183.0	13.875	12.580	1.050	1.630	1.745	53.78	1695.4	5.61	244.4
H12	x 176.0	13.750	12.550	1.020	1.567	1.683	51.79	1613.9	5.58	234.7
H12	x 169.0	13.625	12.510	.980	1.505	1.620	49.68	1532.0	5.55	224.9
H12	x 162.0	13.500	12.470	.940	1.442	1.558	47.57	1451.9	5.52	215.1
H12	x 154.5	13.375	12.430	.900	1.380	1.495	45.48	1373.5	5.50	205.4
H12	x 147.5	13.250	12.390	.860	1.317	1.433	43.40	1296.9	5.47	195.8
H12	x 140.5	13.125	12.350	.820	1.255	1.370	41.32	1222.1	5.44	186.2
H12	x 133.5	13.000	12.310	.780	1.192	1.308	39.26	1148.9	5.41	176.8
H12	x 126.5	12.875	12.270	.740	1.130	1.245	37.21	1077.4	5.38	167.4
H12	x 119.5	12.750	12.230	.700	1.067	1.183	35.16	1007.5	5.35	158.0
H12	x 113.0	12.625	12.200	.670	1.005	1.120	33.25	941.0	5.32	149.1
H12	x 106.0	12.500	12.160	.630	.942	1.058	31.23	874.3	5.29	139.9
H12	x 99.5	12.375	12.120	.590	.880	.995	29.21	809.2	5.26	130.8
H12	x 92.5	12.250	12.080	.550	.817	.933	27.21	745.7	5.23	121.7
H12	x 85.5	12.125	12.040	.510	.755	.870	25.21	683.6	5.21	112.8
H12	x 79.0	12.000	12.000	.470	.692	.808	23.23	623.1	5.18	103.9
G12a	x 76.5	12.120	10.290	.510	.620	1.027	22.50	594.2	5.14	98.1
H12	x 72.5	11.875	11.960	.430	.630	.745	21.25	564.1	5.15	95.0
G12a	x 70.5	12.000	10.250	.470	.560	.967	20.79	543.6	5.11	90.6
H $\frac{12}{10}$	x 70.0	12.000	10.120	.470	.711	.808	20.59	538.8	5.12	89.8
H12	x 65.5	11.750	11.920	.390	.567	.683	19.29	506.6	5.12	86.2
G12a	x 66.0	11.880	10.230	.450	.500	.907	19.32	496.9	5.07	83.7



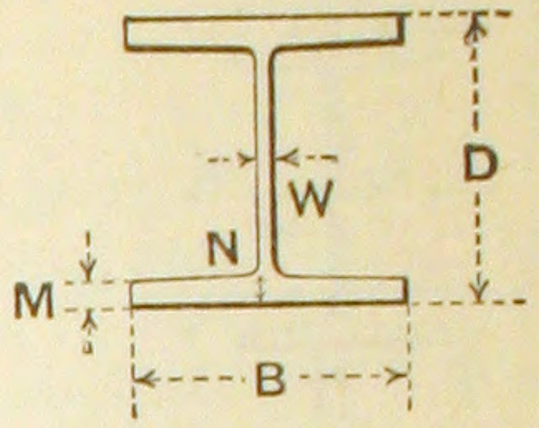
PROPERTIES OF BETHLEHEM SHAPES USED AS BEAMS



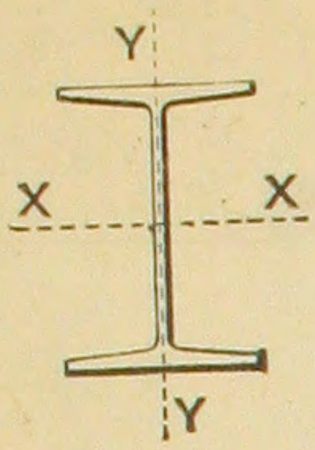
AXIS Y-Y			COEFFICIENTS OF STRENGTH IN FOOT POUNDS		MOMENTS OF RESISTANCE IN FOOT POUNDS		Maximum Safe Shear on Web, in Pounds	Weight per Foot, Pounds
Moment of Inertia, Inches^4 **I′**	Radius of Gyration, Inches **r′**	Section Modulus, Inches^3 **S′**	For Fiber Stress of 18,000 Lbs. per Sq. In. **C**	For Fiber Stress of 16,000 Lbs. per Sq. In. **C′**	For Fiber Stress of 18,000 Lbs. per Sq. In. **R**	For Fiber Stress of 16,000 Lbs. per Sq. In. **R′**		
578.7	3.22	91.7	3,053,000	2,714,000	381,600	339,200	183,100	190.0
552.4	3.20	87.8	2,933,000	2,607,000	366,600	325,800	174,800	183.0
527.7	3.19	84.1	2,817,000	2,504,000	352,100	313,000	168,300	176.0
502.2	3.18	80.3	2,699,000	2,399,000	337,300	299,800	160,200	169.0
477.0	3.17	76.5	2,581,000	2,294,000	322,600	286,800	152,300	162.0
452.3	3.15	72.8	2,465,000	2,191,000	308,100	273,900	144,500	154.5
428.1	3.14	69.1	2,349,000	2,088,000	293,600	261,000	136,700	147.5
404.2	3.13	65.5	2,235,000	1,986,000	279,300	248,300	129,200	140.5
380.8	3.11	61.9	2,121,000	1,885,000	265,100	235,700	121,700	133.5
357.7	3.10	58.3	2,008,000	1,785,000	251,000	223,100	114,300	126.5
335.1	3.09	54.8	1,897,000	1,686,000	237,100	210,700	107,100	119.5
313.7	3.07	51.4	1,789,000	1,590,000	223,600	198,800	101,500	113.0
291.8	3.06	48.0	1,679,000	1,492,000	209,800	186,500	94,500	106.0
270.3	3.04	44.6	1,569,000	1,395,000	196,200	174,400	87,620	99.5
249.2	3.03	41.3	1,461,000	1,299,000	182,600	162,300	80,850	92.5
228.5	3.01	38.0	1,353,000	1,203,000	169,200	150,400	73,340	85.5
208.2	2.99	34.7	1,246,000	1,108,000	155,800	138,500	65,480	79.0
132.1	2.42	25.7	1,177,000	1,046,000	147,100	130,700	73,900	76.5
188.2	2.98	31.5	1,140,000	1,013,000	142,500	126,700	57,710	72.5
119.7	2.40	23.4	1,087,000	966,300	135,900	120,800	66,000	70.5
127.3	2.49	25.2	1,078,000	957,900	134,700	119,700	65,480	70.0
168.6	2.96	28.3	1,035,000	919,700	129,300	115,000	50,040	65.5
108.3	2.37	21.2	1,004,000	892,400	125,500	111,500	61,900	66.0



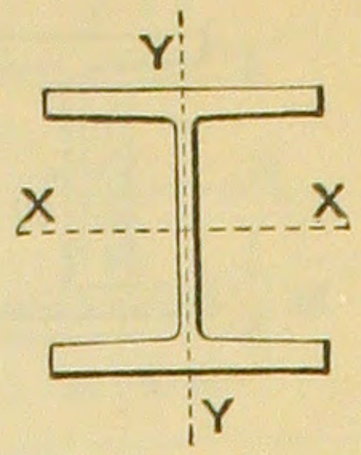
PROPERTIES OF BETHLEHEM SHAPES USED AS BEAMS



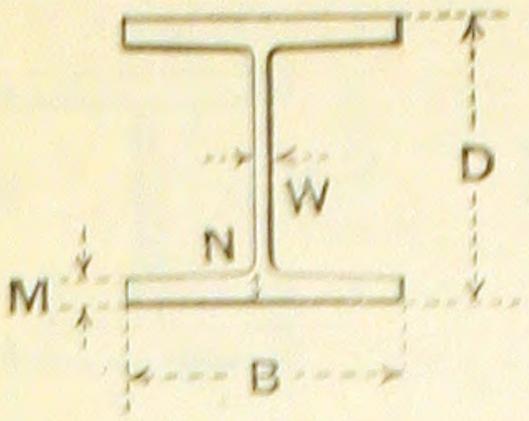
Section Number	Weight per Foot, Pounds	Nominal Depth of Beam, Inches D	Width of Flange, Inches B	Thickness in Inches: Web W	Thickness in Inches: Flange M	Thickness in Inches: Flange N	Area of Section, Square Inches	Axis X-X: Moment of Inertia, Inches⁴ I	Axis X-X: Radius of Gyration, Inches r	Axis X-X: Section Modulus, Inches³ S
H 12 x	64.0	11.875	10.080	.430	.649	.745	18.85	488.2	5.09	82.2
G12 x	61.0	12.120	10.030	.410	.465	.866	17.92	483.6	5.20	79.8
H 12 x	58.0	11.750	10.040	.390	.586	.683	17.12	438.8	5.06	74.7
G12 x	55.5	12.000	10.000	.380	.405	.806	16.35	435.6	5.16	72.6
H 12 x	55.0	11.875	8.120	.430	.668	.745	16.27	406.9	5.00	68.5
G12 x	51.5	11.910	9.980	.360	.360	.761	15.21	400.6	5.13	67.3
H 12 x	52.5	11.625	10.000	.350	.524	.620	15.40	390.7	5.04	67.2
H 12 x	50.5	11.750	8.080	.390	.606	.683	14.79	366.1	4.98	62.3
B12a x	48.5	12.250	6.815	.395	.593	.860	14.28	373.2	5.11	60.9
H 12 x	45.5	11.625	8.040	.350	.543	.620	13.31	326.4	4.95	56.1
B12a x	44.0	12.120	6.780	.360	.528	.795	12.97	335.1	5.08	55.3
B12a x	40.0	12.000	6.750	.330	.468	.735	11.80	301.2	5.05	50.2
H 12 x	40.5	11.500	8.000	.310	.481	.558	11.85	287.7	4.93	50.0
B12 x	36.0	12.250	6.555	.300	.415	.675	10.58	281.8	5.16	46.0
B12 x	31.5	12.120	6.525	.270	.350	.610	9.36	245.7	5.12	40.5
B12 x	28.0	12.000	6.500	.245	.290	.550	8.28	213.6	5.08	35.6
B12 x	25.0	11.880	6.495	.240	.230	.490	7.44	185.1	4.99	31.2
BJ12 x	18.5	12.000	4.125	.240	.240	.402	5.44	121.5	4.73	20.2



PROPERTIES OF BETHLEHEM SHAPES USED AS BEAMS



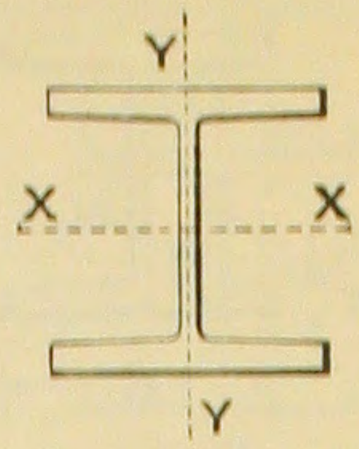
AXIS Y-Y			COEFFICIENTS OF STRENGTH IN FOOT POUNDS		MOMENTS OF RESISTANCE IN FOOT POUNDS		Maximum Safe Shear on Web, in Pounds	Weight per Foot, Pounds
Moment of Inertia, Inches^4 **I′**	Radius of Gyration, Inches **r′**	Section Modulus, Inches^3 **S′**	For Fiber Stress of 18,000 Lbs. per Sq. In. **C**	For Fiber Stress of 16,000 Lbs. per Sq. In. **C′**	For Fiber Stress of 18,000 Lbs. per Sq. In. **R**	For Fiber Stress of 16,000 Lbs. per Sq. In. **R′**		
115.1	2.47	22.8	986,600	877,000	123,300	109,600	57,710	64.0
95.9	2.31	19.1	957,700	851,300	119,700	106,400	55,300	61.0
103.2	2.45	20.6	896,300	796,700	112,000	99,590	50,040	58.0
84.9	2.28	17.0	871,100	774,300	108,900	96,790	49,300	55.5
61.5	1.94	15.2	822,400	731,000	102,800	91,380	57,710	55.0
76.9	2.25	15.4	807,200	717,500	100,900	89,690	45,300	51.5
91.5	2.44	18.3	806,700	717,000	100,800	89,630	42,470	52.5
55.1	1.93	13.6	747,800	664,700	93,470	83,080	50,040	50.5
35.1	1.57	10.29	731,200	650,000	91,400	81,250	52,800	48.5
48.9	1.92	12.2	673,800	598,900	84,220	74,860	42,470	45.5
31.1	1.55	9.18	663,700	589,900	82,960	73,740	45,800	44.0
27.6	1.53	8.18	602,500	535,500	75,310	66,940	39,900	40.0
42.8	1.90	10.7	600,400	533,700	75,050	66,710	35,030	40.5
22.7	1.46	6.93	552,000	490,700	69,000	61,340	34,500	36.0
19.4	1.44	5.93	486,500	432,400	60,810	54,050	28,600	31.5
16.4	1.41	5.04	427,200	379,800	53,400	47,470	23,900	28.0
13.6	1.35	4.19	374,000	332,400	46,740	41,550	22,800	25.0
3.33	.78	1.61	243,000	216,000	30,370	26,990	22,530	18.5



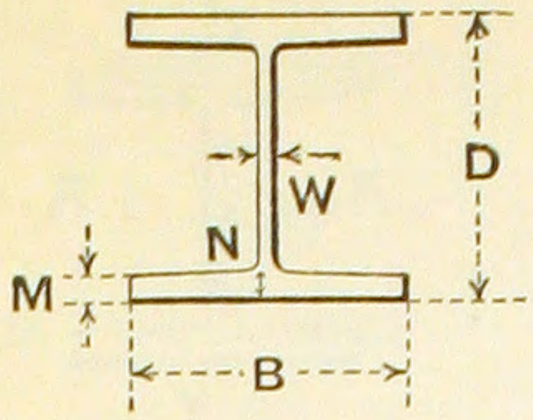
PROPERTIES OF BETHLEHEM SHAPES USED AS BEAMS

Section Number	Weight per Foot, Pounds	Nominal Depth of Beam, Inches D	Width of Flange, Inches B	THICKNESS IN INCHES			Area of Section, Square Inches	AXIS X-X		
				Web	Flange			Moment of Inertia, Inches⁴	Radius of Gyration, Inches	Section Modulus, Inches³
				W	M	N		I	r	S
H $\frac{10}{12}$	x 246.0	13.000	14.570	1.220	2.040	2.173	72.30	1916.1	5.15	294.8
H $\frac{10}{12}$	x 238.0	12.875	14.530	1.180	1.980	2.113	70.04	1835.8	5.12	285.1
H $\frac{10}{12}$	x 230.0	12.750	14.500	1.150	1.915	2.048	67.77	1753.1	5.09	275.0
H $\frac{10}{12}$	x 222.0	12.625	14.460	1.110	1.850	1.983	65.38	1670.5	5.05	264.7
H $\frac{10}{12}$	x 215.0	12.500	14.430	1.080	1.790	1.923	63.27	1597.2	5.02	255.6
H $\frac{10}{12}$	x 208.0	12.375	14.400	1.050	1.730	1.863	61.17	1525.5	4.99	246.4
H $\frac{10}{12}$	x 200.0	12.250	14.360	1.010	1.665	1.798	58.80	1448.4	4.96	236.5
H $\frac{10}{12}$	x 192.0	12.125	14.320	.970	1.600	1.733	56.45	1373.2	4.93	226.6
H $\frac{10}{12}$	x 185.0	12.000	14.290	.940	1.540	1.673	54.37	1306.3	4.90	217.7
H $\frac{10}{12}$	x 177.0	11.875	14.250	.900	1.480	1.613	52.18	1239.6	4.87	208.7
H $\frac{10}{12}$	x 170.0	11.750	14.220	.870	1.415	1.548	49.98	1170.9	4.84	199.3
H $\frac{10}{12}$	x 162.0	11.625	14.190	.840	1.350	1.483	47.78	1103.9	4.81	190.0
H $\frac{10}{12}$	x 155.0	11.500	14.150	.800	1.290	1.423	45.62	1042.0	4.78	181.2
H $\frac{10}{12}$	x 148.0	11.375	14.110	.760	1.230	1.363	43.46	981.5	4.75	172.5
H $\frac{10}{12}$	x 140.0	11.250	14.080	.730	1.165	1.298	41.29	919.2	4.72	163.4
H $\frac{10}{12}$	x 133.0	11.125	14.040	.690	1.100	1.233	39.02	857.4	4.69	154.2
H10	x 136.5	11.750	10.550	.940	1.452	1.548	40.08	893.3	4.72	152.1
H $\frac{10}{12}$	x 125.0	11.000	14.000	.650	1.040	1.173	36.89	801.4	4.66	145.7
H10	x 130.0	11.625	10.510	.900	1.389	1.486	38.30	843.0	4.69	145.0
H10	x 124.0	11.500	10.470	.860	1.327	1.423	36.52	794.0	4.66	138.1
H10	x 118.0	11.375	10.430	.820	1.264	1.361	34.76	746.3	4.63	131.2

PROPERTIES OF BETHLEHEM SHAPES USED AS BEAMS



AXIS Y-Y			COEFFICIENTS OF STRENGTH IN FOOT POUNDS		MOMENTS OF RESISTANCE IN FOOT POUNDS		Maximum Safe Shear on Web, in Pounds	Weight per Foot, Pounds
Moment of Inertia, Inches^4 I′	Radius of Gyration, Inches r′	Section Modulus, Inches^3 S′	For Fiber Stress of 18,000 Lbs. per Sq. In. C	For Fiber Stress of 16,000 Lbs. per Sq. In. C′	For Fiber Stress of 18,000 Lbs. per Sq. In. R	For Fiber Stress of 16,000 Lbs. per Sq. In. R′		
1071.6	3.85	147.1	3,537,000	3,144,000	442,200	393,000	190,300	246.0
1031.9	3.84	142.0	3,421,000	3,041,000	427,600	380,100	182,400	238.0
992.4	3.83	136.9	3,300,000	2,933,000	412,500	366,700	176,000	230.0
951.3	3.81	131.6	3,177,000	2,824,000	397,100	353,000	168,100	222.0
915.2	3.80	126.9	3,067,000	2,726,000	383,300	340,700	162,000	215.0
879.6	3.79	122.2	2,957,000	2,629,000	369,700	328,600	156,000	208.0
840.0	3.78	117.0	2,838,000	2,522,000	354,700	315,300	148,500	200.0
801.1	3.77	111.9	2,719,000	2,417,000	339,900	302,100	141,100	192.0
766.8	3.76	107.3	2,613,000	2,322,000	326,600	290,300	135,400	185.0
731.3	3.74	102.6	2,504,000	2,226,000	313,000	278,300	128,300	177.0
695.5	3.73	97.8	2,392,000	2,126,000	299,000	265,700	122,700	170.0
660.0	3.72	93.0	2,280,000	2,027,000	285,000	253,300	117,100	162.0
626.0	3.70	88.5	2,175,000	1,933,000	271,800	241,600	110,400	155.0
592.6	3.69	84.0	2,070,000	1,840,000	258,700	230,000	103,800	148.0
558.5	3.68	79.3	1,961,000	1,743,000	245,100	217,900	98,550	140.0
523.7	3.66	74.6	1,850,000	1,645,000	231,300	205,600	92,100	133.0
290.0	2.69	55.0	1,825,000	1,622,000	228,100	202,700	132,500	136.5
491.7	3.65	70.2	1,749,000	1,554,000	218,600	194,300	85,800	125.0
274.5	2.68	52.2	1,740,000	1,547,000	217,600	193,400	125,600	130.0
259.4	2.66	49.5	1,657,000	1,473,000	207,100	184,100	118,700	124.0
244.5	2.65	46.9	1,575,000	1,400,000	196,800	175,000	111,900	118.0



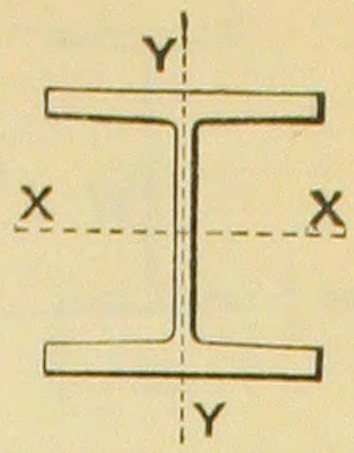
PROPERTIES OF
BETHLEHEM SHAPES
USED AS BEAMS

Section Number	Weight per Foot, Pounds	Nominal Depth of Beam, Inches D	Width of Flange, Inches B	THICKNESS IN INCHES			Area of Section, Square Inches	AXIS X-X		
				Web	Flange			Moment of Inertia, Inches⁴	Radius of Gyration, Inches	Section Modulus, Inches³
				W	M	N		I	r	S
H 10 x	113.0	11.000	12.260	.650	1.057	1.173	33.25	710.8	4.62	129.2
H10 x	112.0	11.250	10.390	.780	1.202	1.298	33.00	699.9	4.60	124.4
H 10 x	107.0	10.875	12.230	.620	.997	1.113	31.45	663.5	4.59	122.0
H10 x	106.5	11.125	10.350	.740	1.139	1.236	31.26	654.7	4.58	117.7
H 10 x	100.0	10.750	12.200	.590	.932	1.048	29.54	613.9	4.56	114.2
H10 x	100.5	11.000	10.310	.700	1.077	1.173	29.53	610.6	4.55	111.0
H 10 x	94.0	10.625	12.170	.560	.867	.983	27.63	565.7	4.52	106.5
H10 x	95.0	10.875	10.280	.670	1.014	1.111	27.91	568.9	4.51	104.6
H 10 x	88.0	10.500	12.140	.530	.807	.923	25.86	522.1	4.49	99.4
H10 x	89.0	10.750	10.240	.630	.952	1.048	26.20	527.2	4.49	98.1
H 10 x	82.0	10.375	12.100	.490	.747	.863	23.98	478.6	4.47	92.2
H10 x	83.5	10.625	10.200	.590	.889	.986	24.49	486.6	4.46	91.6
H10 x	77.5	10.500	10.160	.550	.827	.923	22.80	447.2	4.43	85.2
H 10 x	75.0	10.250	12.060	.450	.682	.798	22.00	433.2	4.44	84.5
H10 x	72.0	10.375	10.120	.510	.764	.861	21.11	408.9	4.40	78.8
H 10 x	68.0	10.125	12.030	.420	.617	.733	20.13	390.0	4.40	77.1
H10 x	66.0	10.250	10.080	.470	.702	.798	19.44	371.7	4.37	72.5
H 10 x	62.0	10.000	11.990	.380	.557	.673	18.29	350.1	4.38	70.0

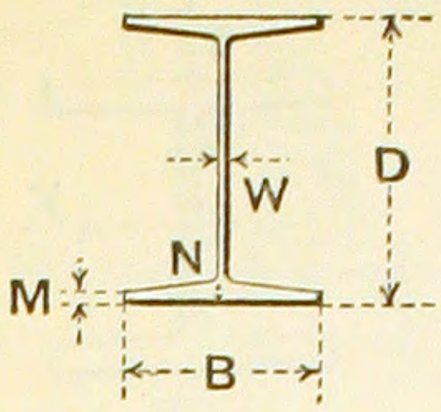
PROPERTIES OF

BETHLEHEM SHAPES

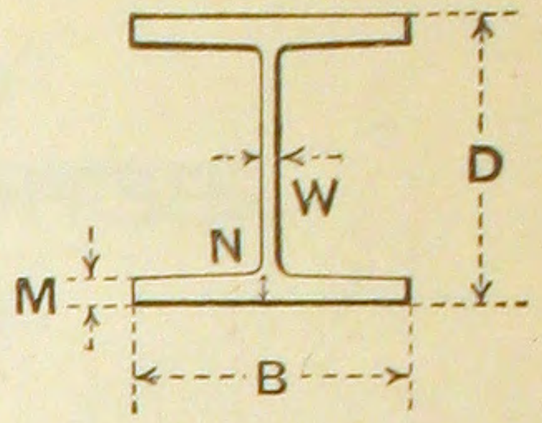
USED AS BEAMS



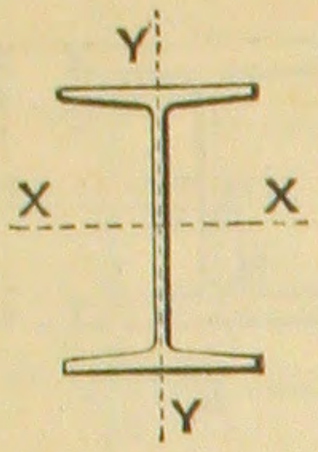
AXIS Y-Y			COEFFICIENTS OF STRENGTH IN FOOT POUNDS		MOMENTS OF RESISTANCE IN FOOT POUNDS		Maximum Safe Shear on Web, in Pounds	Weight per Foot, Pounds
Moment of Inertia, Inches^4 I′	Radius of Gyration, Inches r′	Section Modulus, Inches^3 S′	For Fiber Stress of 18,000 Lbs. per Sq. In. C	For Fiber Stress of 16,000 Lbs. per Sq. In. C′	For Fiber Stress of 18,000 Lbs. per Sq. In. R	For Fiber Stress of 16,000 Lbs. per Sq. In. R′		
334.3	3.17	54.5	1,551,000	1,378,000	193,800	172,300	85,800	113.0
229.9	2.64	44.3	1,493,000	1,327,000	186,600	165,900	105,300	112.0
313.5	3.16	51.3	1,464,000	1,301,000	183,000	162,600	80,950	107.0
215.7	2.63	41.7	1,412,000	1,255,000	176,500	156,900	98,790	106.5
291.5	3.14	47.8	1,371,000	1,218,000	171,300	152,300	76,110	100.0
201.7	2.61	39.1	1,332,000	1,184,000	166,500	148,000	92,400	100.5
269.7	3.12	44.3	1,278,000	1,136,000	159,800	142,000	71,370	94.0
188.6	2.60	36.7	1,255,000	1,116,000	156,900	139,500	87,440	95.0
249.8	3.11	41.2	1,193,000	1,061,000	149,200	132,600	66,780	88.0
175.2	2.59	34.2	1,177,000	1,046,000	147,100	130,800	81,270	89.0
229.6	3.09	37.9	1,107,000	983,700	138,300	123,000	61,030	82.0
162.0	2.57	31.8	1,099,000	977,100	137,400	122,100	75,230	83.5
149.1	2.56	29.4	1,022,000	908,600	127,800	113,600	69,300	77.5
208.3	3.08	34.5	1,014,000	901,600	126,800	112,700	55,350	75.0
136.5	2.54	27.0	945,900	840,800	118,200	105,100	63,500	72.0
187.8	3.05	31.2	924,800	822,000	115,600	102,800	50,270	68.0
124.2	2.53	24.6	870,300	773,600	108,800	96,700	57,810	66.0
168.7	3.04	28.1	840,200	746,900	105,000	93,360	43,740	62.0



PROPERTIES OF BETHLEHEM SHAPES USED AS BEAMS



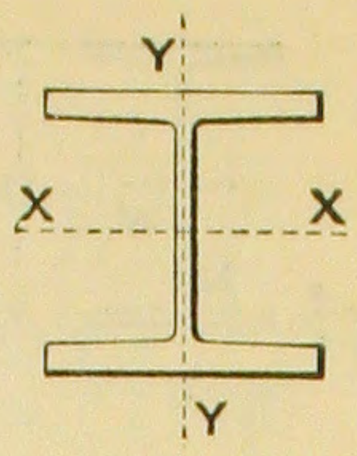
Section Number	Weight per Foot, Pounds	Nominal Depth of Beam, Inches D	Width of Flange, Inches B	THICKNESS IN INCHES: Web W	Flange M	Flange N	Area of Section, Square Inches	AXIS X-X: Moment of Inertia, Inches⁴ I	Radius of Gyration, Inches r	Section Modulus, Inches³ S
H10	x 60.5	10.125	10.040	.430	.639	.736	17.77	335.5	4.34	66.3
H10	x 55.0	10.000	10.000	.390	.577	.673	16.12	300.4	4.32	60.1
G10	x 50.0	10.120	9.040	.360	.445	.807	14.62	277.5	4.36	54.8
H10	x 49.5	9.875	9.970	.360	.514	.611	14.57	267.2	4.28	54.1
H $\frac{10}{8}$	x 47.5	10.000	8.110	.390	.596	.673	13.90	251.3	4.25	50.3
G10	x 44.5	10.000	9.000	.320	.385	.747	13.14	246.7	4.33	49.3
G10	x 41.5	9.910	8.990	.310	.340	.702	12.23	225.8	4.30	45.6
H $\frac{10}{8}$	x 42.5	9.875	8.070	.350	.533	.611	12.49	223.0	4.23	45.2
H $\frac{10}{8}$	x 38.0	9.750	8.030	.310	.471	.548	11.09	195.6	4.20	40.1
H $\frac{10}{8}$	x 33.5	9.625	8.000	.280	.408	.486	9.80	169.9	4.16	35.3
B10	x 28.5	10.190	5.785	.285	.380	.609	8.41	154.1	4.28	30.2
B10	x 26.0	10.090	5.770	.270	.330	.559	7.68	137.9	4.24	27.3
B10	x 23.5	10.000	5.750	.250	.285	.514	6.96	123.2	4.21	24.6
B10	x 21.0	9.900	5.740	.240	.235	.464	6.28	108.1	4.15	21.8
BJ10	x 16.5	10.000	4.000	.240	.240	.397	4.86	77.4	3.99	15.5
G9	x 43.5	9.120	8.540	.350	.405	.746	12.73	195.4	3.92	42.8
G9	x 38.5	9.000	8.500	.310	.345	.686	11.35	171.9	3.89	38.2
G9	x 36.0	8.940	8.480	.290	.315	.656	10.66	160.5	3.88	35.9
B9	x 22.0	9.060	5.510	.260	.280	.499	6.51	93.9	3.80	20.7
B9	x 20.5	9.000	5.500	.250	.250	.469	6.09	86.5	3.77	19.2



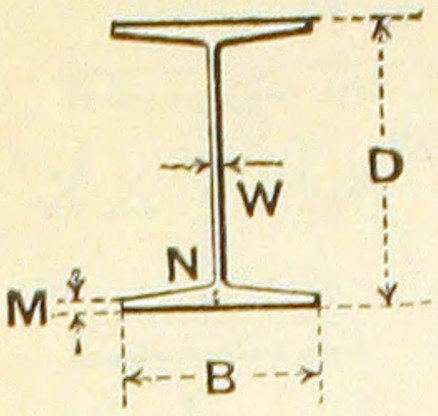
PROPERTIES OF BETHLEHEM SHAPES

USED AS COLUMNS

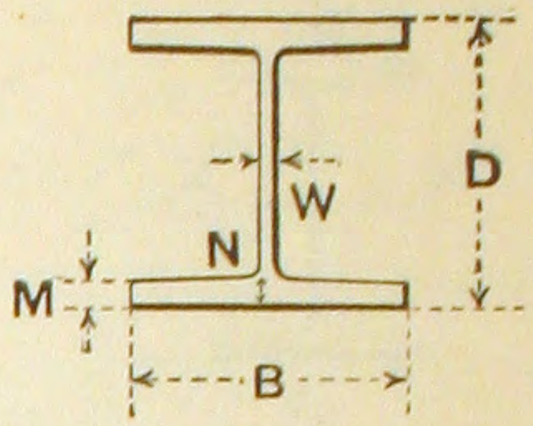
BEAMS



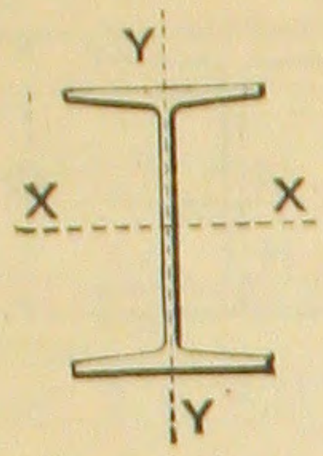
AXIS Y-Y			COEFFICIENTS OF STRENGTH IN FOOT POUNDS		MOMENTS OF RESISTANCE IN FOOT POUNDS		Maximum Safe Shear on Web, in Pounds	Weight per Foot, Pounds
Moment of Inertia, Inches^4 **I′**	Radius of Gyration Inches **r′**	Section Modulus, Inches^3 **S′**	For Fiber Stress of 18,000 Lbs. per Sq. In. **C**	For Fiber Stress of 16,000 Lbs. per Sq. In. **C′**	For Fiber Stress of 18,000 Lbs. per Sq. In. **R**	For Fiber Stress of 16,000 Lbs. per Sq. In. **R′**		
112.2	2.51	22.3	795,300	706,900	99,410	88,370	51,780	60.5
100.4	2.50	20.1	721,000	640,900	90,130	80,110	45,230	55.0
66.4	2.13	14.7	658,000	584,900	82,250	73,110	41,500	50.0
89.1	2.47	17.9	649,300	577,100	81,160	72,140	40,240	49.5
54.8	1.99	13.5	603,000	536,000	75,380	67,000	45,230	47.5
58.2	2.10	12.9	592,000	526,300	74,010	65,780	35,000	44.5
52.6	2.07	11.7	546,900	486,100	68,360	60,760	33,200	41.5
48.5	1.97	12.0	542,000	481,800	67,750	60,220	38,760	42.5
42.4	1.96	10.6	481,600	428,100	60,200	53,510	32,390	38.0
36.6	1.93	9.1	423,600	376,500	52,940	47,060	27,600	33.5
14.2	1.30	4.92	362,900	322.600	45,370	40,330	29,500	28.5
12.5	1.28	4.33	328,100	291,600	41,010	36,460	26,900	26.0
10.9	1.25	3.80	295,600	262,800	36,950	32,850	23,600	23.5
9.30	1.22	3.24	262,200	233,000	32,770	29,130	21,900	21.0
3.02	.79	1.51	185,700	165,000	23,210	20,630	21,740	16.5
51.3	2.01	12.0	514,200	457,000	64,270	57,130	37,200	43.5
44.4	1.98	10.4	458,500	407,500	57,310	50,940	31,300	38.5
41.0	1.96	9.67	430,800	382,900	53,850	47,870	28,400	36.0
9.42	1.20	3.42	248,600	221,000	31,080	27,630	24,100	22.0
8.54	1.18	3.10	230,700	205,100	28,840	25,630	22,600	20.5



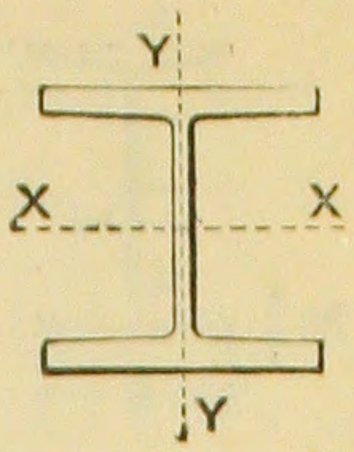
PROPERTIES OF BETHLEHEM SHAPES USED AS BEAMS



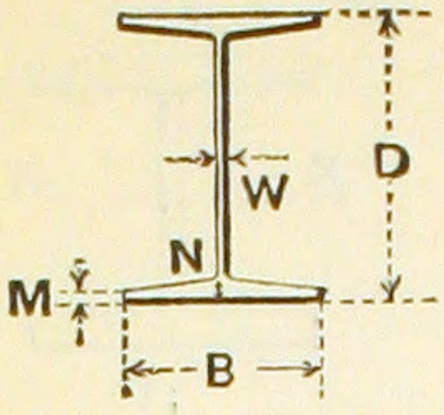
Section Number	Weight per Foot, Pounds	Nominal Depth of Beam, Inches D	Width of Flange, Inches B	THICKNESS IN INCHES			Area of Section, Square Inches	AXIS X-X		
				Web	Flange			Moment of Inertia, Inches^4	Radius of Gyration, Inches	Section Modulus, Inches^3
				W	M	N		I	r	S
H8	x 91.0	9.500	8.470	.780	1.212	1.288	26.77	386.8	3.80	81.4
H8	x 86.0	9.375	8.430	.740	1.149	1.226	25.33	360.5	3.77	76.9
H8	x 81.5	9.250	8.390	.700	1.087	1.163	23.91	335.0	3.74	72.4
H8	x 77.0	9.125	8.360	.670	1.024	1.101	22.59	311.0	3.71	68.2
H8	x 72.0	9.000	8.320	.630	.962	1.038	21.18	287.1	3.68	63.8
H8	x 67.5	8.875	8.280	.590	.899	.976	19.79	264.0	3.65	59.5
H8	x 62.5	8.750	8.240	.550	.837	.913	18.40	241.7	3.62	55.2
H8	x 58.0	8.625	8.200	.510	.774	.851	17.03	220.1	3.60	51.0
H8	x 53.0	8.500	8.160	.470	.712	.788	15.66	199.3	3.57	46.9
H8	x 48.5	8.375	8.120	.430	.649	.726	14.31	179.2	3.54	42.8
H8	x 44.0	8.250	8.080	.390	.587	.663	12.96	159.7	3.51	38.7
H8	x 39.5	8.125	8.040	.350	.524	.601	11.63	141.0	3.48	34.7
G8	x 36.5	8.120	8.020	.310	.370	.691	10.81	132.6	3.50	32.6
H8	x 35.0	8.000	8.000	.310	.462	.538	10.30	123.0	3.46	30.7
H$\frac{8}{6.5}$	x 34.5	8.125	6.600	.350	.538	.601	10.10	118.9	3.43	29.3
G8	x 33.0	8.000	8.000	.290	.310	.631	9.69	116.1	3.46	29.0
H8	x 32.0	7.875	8.000	.310	.399	.476	9.30	107.2	3.40	27.2
H$\frac{8}{6.5}$	x 30.5	8.000	6.560	.310	.476	.538	8.95	103.8	3.41	26.0
G8	x 29.5	7.880	7.995	.285	.250	.571	8.69	100.7	3.41	25.6
H$\frac{8}{6.5}$	x 27.0	7.875	6.530	.280	.413	.476	7.89	89.7	3.37	22.8
H$\frac{8}{6.5}$	x 23.5	7.750	6.500	.250	.351	.413	6.85	76.1	3.33	19.6
B8	x 19.0	8.060	5.270	.270	.240	.448	5.68	63.7	3.35	15.8
B8	x 17.5	8.000	5.250	.250	.210	.418	5.20	57.7	3.33	14.4
BJ8	x 14.5	8.000	3.875	.240	.240	.391	4.28	44.9	3.24	11.2



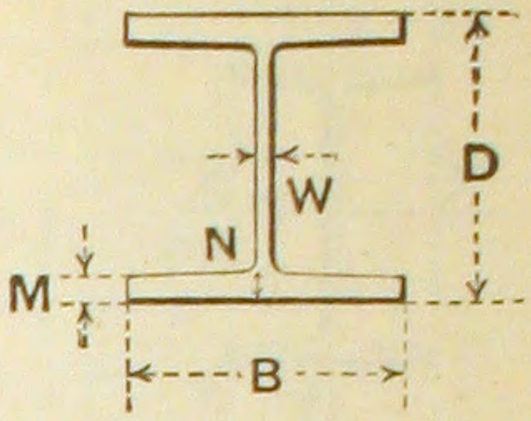
PROPERTIES OF BETHLEHEM SHAPES USED AS BEAMS



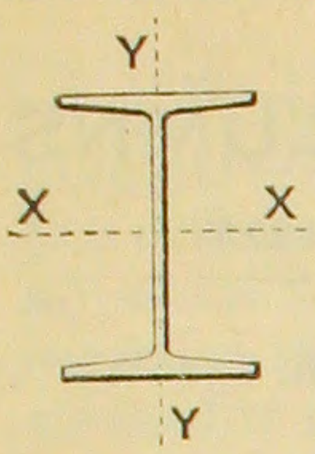
AXIS Y-Y			COEFFICIENTS OF STRENGTH IN FOOT POUNDS		MOMENTS OF RESISTANCE IN FOOT POUNDS		Maximum Safe Shear on Web, in Pounds	Weight per Foot, Pounds
Moment of Inertia, Inches^4 **I′**	Radius of Gyration, Inches **r′**	Section Modulus, Inches^3 **S′**	For Fiber Stress of 18,000 Lbs. per Sq. In. **C**	For Fiber Stress of 16,000 Lbs. per Sq. In. **C′**	For Fiber Stress of 18,000 Lbs. per Sq. In. **R**	For Fiber Stress of 16,000 Lbs. per Sq. In. **R′**		
125.1	2.16	29.6	977,200	868,700	122,200	108,600	88,920	91.0
117.1	2.15	27.8	922,900	820,400	115,400	102,500	83,250	86.0
109.2	2.14	26.0	869,200	772,700	108,700	96,580	77,700	81.5
102.0	2.12	24.4	817,900	727,100	102,200	90,880	73,370	77.0
94.5	2.11	22.7	765,600	680,500	95,700	85,070	68,040	72.0
87.2	2.10	21.1	713,900	634,600	89,240	79,320	62,840	67.5
80.0	2.09	19.4	662,900	589,200	82,860	73,650	57,750	62.5
73.1	2.07	17.8	612,500	544,400	76,560	68,050	52,790	58.0
66.4	2.06	16.3	562,600	500,100	70,330	62,510	47,940	53.0
59.8	2.04	14.7	513,400	456,400	64,170	57,040	43,220	48.5
53.4	2.03	13.2	464,700	413,100	58,090	51,640	38,610	44.0
47.2	2.01	11.7	416,600	370,300	52,070	46,290	33,960	39.5
39.0	1.90	9.72	391,800	348,300	48,980	43,530	29,400	36.5
41.1	2.00	10.3	369,000	328,000	46,120	41,000	28,710	35.0
26.6	1.62	8.07	351,300	312,300	43,920	39,040	33,960	34.5
33.6	1.86	8.39	348,200	309,500	43,530	38,690	26,500	33.0
35.8	1.96	8.95	326,800	290,500	40,850	36,320	28,260	32.0
23.2	1.61	7.07	311,480	276,900	38,940	34,610	28,710	30.5
28.4	1.81	7.10	306,800	272,700	38,350	34,090	25,600	29.5
20.0	1.59	6.11	273,300	243,000	34,170	30,370	24,730	27.0
16.8	1.57	5.18	235,600	209,400	29,450	26,180	20,830	23.5
7.20	1.13	2.73	189,600	168,500	23,700	21,070	23,800	19.0
6.39	1.11	2.44	173,200	153,900	21,650	19,240	21,200	17.5
2.73	.80	1.41	134,700	119,700	16,830	14,960	19,920	14.5



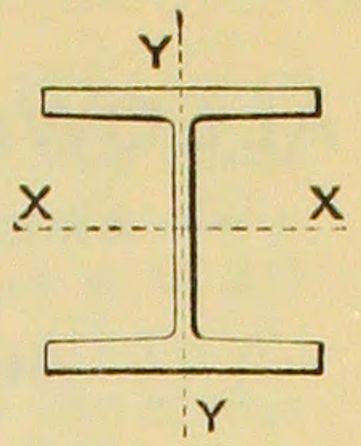
PROPERTIES OF BETHLEHEM SHAPES USED AS BEAMS



Section Number	Weight per Foot, Pounds	Nominal Depth of Beam, Inches D	Width of Flange, Inches B	THICKNESS IN INCHES: Web W	THICKNESS IN INCHES: Flange M	THICKNESS IN INCHES: Flange N	Area of Section, Square Inches	AXIS X-X: Moment of Inertia, Inches⁴ I	AXIS X-X: Radius of Gyration, Inches r	AXIS X-X: Section Modulus, Inches³ S
H $\frac{6}{10}$	x 88.0	7.265	10.400	.990	.942	1.037	25.89	216.9	2.89	59.7
H $\frac{6}{10}$	x 80.0	7.096	10.315	.905	.858	.952	23.53	191.7	2.85	54.0
H $\frac{6}{10}$	x 73.0	6.946	10.241	.831	.783	.877	21.47	170.6	2.82	49.1
H $\frac{6}{10}$	x 67.0	6.818	10.175	.765	.719	.813	19.70	153.3	2.79	45.0
H $\frac{6}{10}$	x 60.0	6.666	10.099	.689	.643	.737	17.65	133.9	2.75	40.2
H $\frac{6}{10}$	x 53.0	6.512	10.022	.612	.566	.660	15.59	115.2	2.72	35.4
H $\frac{6}{10}$	x 46.0	6.356	9.944	.534	.488	.582	13.54	97.4	2.68	30.6
H6	x 40.5	6.750	6.220	.470	.721	.779	11.87	90.5	2.76	26.8
H $\frac{6}{10}$	x 40.0	6.216	9.875	.465	.418	.512	11.71	82.3	2.65	26.5
H6	x 37.0	6.625	6.180	.430	.659	.716	10.83	80.9	2.73	24.4
H6	x 33.5	6.500	6.140	.390	.596	.654	9.80	71.6	2.70	22.0
H6	x 30.0	6.375	6.100	.350	.534	.591	8.77	62.8	2.68	19.7
H6	x 26.5	6.250	6.060	.310	.471	.529	7.76	54.4	2.65	17.4
H6	x 23.0	6.125	6.020	.270	.409	.466	6.76	46.4	2.62	15.2
BS6	x 20.5	6.188	6.060	.300	.330	.388	6.06	41.5	2.62	13.4
H6	x 20.0	6.000	6.000	.250	.346	.404	5.89	39.1	2.58	13.0
BS6	x 18.0	6.094	6.030	.270	.285	.343	5.33	35.8	2.59	11.7
BS6	x 15.5	6.000	6.000	.240	.240	.298	4.61	30.3	2.56	10.1
BJ6	x 11.0	6.000	3.330	.230	.230	.359	3.25	19.3	2.44	6.43



PROPERTIES OF
BETHLEHEM SHAPES
USED AS BEAMS



AXIS Y-Y			COEFFICIENTS OF STRENGTH IN FOOT POUNDS		MOMENTS OF RESISTANCE IN FOOT POUNDS			
Moment of Inertia, Inches⁴ I′	Radius of Gyration Inches r′	Section Modulus, Inches³ S′	For Fiber Stress of 18,000 Lbs. per Sq. In. C	For Fiber Stress of 16,000 Lbs. per Sq. In. C′	For Fiber Stress of 18,000 Lbs. per Sq. In. R	For Fiber Stress of 16,000 Lbs. per Sq. In. R′	Maximum Safe Shear on Web, in Pounds	Weight per Foot, Pounds
182.0	2.65	35.0	716,600	637,000	89,580	79,630	86,310	88.0
162.0	2.62	31.4	648,500	576,500	81,060	72,060	77,060	80.0
145.0	2.60	28.3	589,500	524,000	73,690	65,500	69,270	73.0
130.9	2.58	25.7	539,800	479,800	67,470	59,980	62,590	67.0
114.9	2.55	22.7	482,100	428,500	60,260	53,560	55,110	60.0
99.3	2.52	19.8	424,700	377,500	53,090	47,190	47,820	53.0
84.1	2.49	16.9	367,700	326,900	45,970	40,860	40,730	46.0
29.6	1.58	9.52	321,900	286,200	40,240	35,770	38,070	40.5
71.1	2.46	14.4	317,600	282,300	39,700	35,290	34,690	40.0
26.6	1.57	8.60	293,000	260,400	36,620	32,550	34,190	37.0
23.6	1.55	7.70	264,500	235,100	33,070	29,390	30,420	33.5
20.8	1.54	6.82	236,500	210,300	29,570	26,280	26,780	30.0
18.1	1.53	5.96	209,000	185,700	26,120	23,220	23,250	26.5
15.4	1.51	5.12	181,800	161,600	22,730	20,200	19,850	23.0
12.8	1.45	4.23	161,000	143,100	20,130	17,890	22,250	20.5
13.0	1.49	4.34	156,500	139,100	19,560	17,390	17,700	20.0
11.0	1.43	3.64	141,000	125,300	17,620	15,660	19,580	18.0
9.19	1.41	3.06	121,100	107,600	15,140	13,450	16,630	15.5
1.64	.71	.98	77,160	68,590	9,645	8,574	15,850	11.0

ALLOWABLE UNIT STRESSES FOR COLUMNS

AMERICAN INSTITUTE OF STEEL CONSTRUCTION, 1923

Main, and Short Secondary Members: ratios $\frac{l}{r}$ from 0 to 120.

Allowable stress in Pounds per Square Inch:

15,000 for ratios $\frac{l}{r}$ from 0 to 60.

$$\frac{18{,}000}{1+\frac{l^2}{18{,}000\ r^2}}$$ **for ratios $\frac{l}{r}$ from 60 to 120.**

Ratio $\frac{l}{r}$	Allowable Stress, Pounds per Square Inch	Difference △	Ratio $\frac{l}{r}$	Allowable Stress, Pounds per Square Inch	Difference △	Ratio $\frac{l}{r}$	Allowable Stress, Pounds per Square Inch	Difference △
60	15,000		**80**	13,279		**100**	11,571	
		84			87			82
61	14,916		81	13,192		101	11,489	
		84			87			82
62	14,832		82	13,105		102	11,407	
		84			87			82
63	14,748		83	13,018		103	11,325	
		85			87			81
64	14,663		84	12,931		104	11,244	
		85			87			81
65	14,578		85	12,844		105	11,163	
		85			86			81
66	14,493		86	12,758		106	11,082	
		86			86			80
67	14,407		87	12,672		107	11,002	
		86			87			80
68	14,321		88	12,585		108	10,922	
		86			85			79
69	14,235		89	12,500		109	10,843	
		87			86			79
70	14,148		**90**	12,414		**110**	10,764	
		86			86			78
71	14,062		91	12,328		111	10,686	
		87			85			78
72	13,975		92	12,243		112	10,608	
		87			85			78
73	13,888		93	12,158		113	10,530	
		87			85			77
74	13,801		94	12,073		114	10,453	
		87			84			77
75	13,714		95	11,989		115	10,376	
		87			84			76
76	13,627		96	11,905		116	10,300	
		87			84			76
77	13,540		97	11,821		117	10,224	
		87			84			75
78	13,453		98	11,737		118	10,149	
		87			83			75
79	13,366		99	11,654		119	10,074	
		87			83			74
80	13,279		**100**	11,571		**120**	10,000	

The tables of Allowable Unit Stresses for Columns give the allowable stress corresponding to each integral value of l/r, together with the difference, $\triangle$, between each pair of such allowable stresses standing adjacent to each other in the table. As the stresses decrease with an increase in l/r, all the differences are negative. To find the allowable stress for any intermediate value of l/r, look up the value of the stress for the integral part of l/r, and the difference, $\triangle$, between this stress and that corresponding to the next higher value of l/r. Corresponding to this difference there will be found in the Interpolation Table the values of .10 $\triangle$ to .90 $\triangle$ corresponding to the .1 increments in l/r. If l/r is given to hundredths, one tenth the increment for ten times the number of hundredths and the increment for the number of tenths may be added together. As this increment is negative, subtract the number so obtained from the stress for the integral part of l/r. The result is the allowable stress for the given l/r. The computed difference should be rounded up to the units place before subtracting.

For example, suppose the allowable stress is desired when $l/r = 107.37$

The allowable stress when $l/r = 107$ is 11,002
The difference, $\triangle = -80$
The difference for $\triangle$ l/r of .30 is ..... -24.0
One tenth the difference for 10 x .07 or .70 is ..... - 5.6
The resulting difference is ..... -29.6 or -30
The allowable stress when $l/r = 107.37$ is 10,972

INTERPOLATION TABLE FOR DIFFERENCES $\triangle$

$\triangle$	INCREMENTS								
	.10 $\triangle$	.20 $\triangle$	.30 $\triangle$	.40 $\triangle$	.50 $\triangle$	.60 $\triangle$	.70 $\triangle$	.80 $\triangle$	.90 $\triangle$
87	8.7	17.4	26.1	34.8	43.5	52.2	60.9	69.6	78.3
86	8.6	17.2	25.8	34.4	43.0	51.6	60.2	68.8	77.4
85	8.5	17.0	25.5	34.0	42.5	51.0	59.5	68.0	76.5
84	8.4	16.8	25.2	33.6	42.0	50.4	58.8	67.2	75.6
83	8.3	16.6	24.9	33.2	41.5	49.8	58.1	66.4	74.7
82	8.2	16.4	24.6	32.8	41.0	49.2	57.4	65.6	73.8
81	8.1	16.2	24.3	32.4	40.5	48.6	56.7	64.8	72.9
80	8.0	16.0	24.0	32.0	40.0	48.0	56.0	64.0	72.0
79	7.9	15.8	23.7	31.6	39.5	47.4	55.3	63.2	71.1
78	7.8	15.6	23.4	31.2	39.0	46.8	54.6	62.4	70.2
77	7.7	15.4	23.1	30.8	38.5	46.2	53.9	61.6	69.3
76	7.6	15.2	22.8	30.4	38.0	45.6	53.2	60.8	68.4
75	7.5	15.0	22.5	30.0	37.5	45.0	52.5	60.0	67.5
74	7.4	14.8	22.2	29.6	37.0	44.4	51.8	59.2	66.6

It should be noted that the calculation could be based on the stress for $l/r = 108$ in the above problem, in which case $\triangle$ $l/r = -.63$, and the increments of stress are all positive, which simplifies calculations somewhat.

ALLOWABLE UNIT STRESSES FOR COLUMNS

AMERICAN INSTITUTE OF STEEL CONSTRUCTION, 1923

Secondary Members Only: ratios $\frac{l}{r}$ from 120 to 200.

Allowable unit stress in Pounds per Square Inch:

$$\frac{18{,}000}{1 + \frac{l^2}{18{,}000\ r^2}}$$ **for ratios $\frac{l}{r}$ from 120 to 200.**

No column or strut is permitted whose $\frac{l}{r}$ is greater than 200.

Ratio $\frac{l}{r}$	Allowable Stress, Pounds per Square Inch	Difference △	Ratio $\frac{l}{r}$	Allowable Stress, Pounds per Square Inch	Difference △	Ratio $\frac{l}{r}$	Allowable Stress, Pounds per Square Inch	Difference △
120	10,000	74	146	8,241	61	173	6,760	49
121	9,926	73	147	8,180	60	174	6,711	49
122	9,853	73	148	8,120	60	175	6,663	48
123	9,780	72	149	8,060	60	176	6,616	47
124	9,708	72	**150**	8,000	59	177	6,568	48
125	9,636	72	151	7,941	59	178	6,521	47
126	9,564	71	152	7,882	58	179	6,475	46
127	9,493	70	153	7,824	57	**180**	6,429	46
128	9,423	70	154	7,767	57	181	6,383	46
129	9,353	69	155	7,710	57	182	6,338	45
130	9,284	69	156	7,653	56	183	6,293	45
131	9,215	69	157	7,597	56	184	6,248	45
132	9,146	68	158	7,541	55	185	6,204	44
133	9,078	67	159	7,486	55	186	6,160	44
134	9,011	67	**160**	7,431	54	187	6,117	43
135	8,944	66	161	7,377	54	188	6,074	43
136	8,878	66	162	7,323	53	189	6,031	43
137	8,812	66	163	7,270	53	**190**	5,989	42
138	8,746	65	164	7,217	53	191	5,947	42
139	8,681	64	165	7,164	52	192	5,906	41
140	8,617	64	166	7,112	51	193	5,864	42
141	8,553	63	167	7,061	52	194	5,824	40
142	8,490	63	168	7,009	50	195	5,783	41
143	8,427	63	169	6,959	51	196	5,743	40
144	8,364	62	**170**	6,908	50	197	5,703	40
145	8,302	61	171	6,858	49	198	5,664	39
146	8,241		172	6,809	49	199	5,625	39
			173	6,760		**200**	5,586	39

INTERPOLATION TABLE FOR DIFFERENCES △

△	INCREMENTS								
	.10△	.20△	.30△	.40△	.50△	.60△	.70△	.80△	.90△
74	7.4	14.8	22.2	29.6	37.0	44.4	51.8	59.2	66.6
73	7.3	14.6	21.9	29.2	36.5	43.8	51.1	58.4	65.7
72	7.2	14.4	21.6	28.8	36.0	43.2	50.4	57.6	64.8
71	7.1	14.2	21.3	28.4	35.5	42.6	49.7	56.8	63.9
70	7.0	14.0	21.0	28.0	35.0	42.0	49.0	56.0	63.0
69	6.9	13.8	20.7	27.6	34.5	41.4	48.3	55.2	62.1
68	6.8	13.6	20.4	27.2	34.0	40.8	47.6	54.4	61.2
67	6.7	13.4	20.1	26.8	33.5	40.2	46.9	53.6	60.3
66	6.6	13.2	19.8	26.4	33.0	39.6	46.2	52.8	59.4
65	6.5	13.0	19.5	26.0	32.5	39.0	45.5	52.0	58.5
64	6.4	12.8	19.2	25.6	32.0	38.4	44.8	51.2	57.6
63	6.3	12.6	18.9	25.2	31.5	37.8	44.1	50.4	56.7
62	6.2	12.4	18.6	24.8	31.0	37.2	43.4	49.6	55.8
61	6.1	12.2	18.3	24.4	30.5	36.6	42.7	48.8	54.9
60	6.0	12.0	18.0	24.0	30.0	36.0	42.0	48.0	54.0
59	5.9	11.8	17.7	23.6	29.5	35.4	41.3	47.2	53.1
58	5.8	11.6	17.4	23.2	29.0	34.8	40.6	46.4	52.2
57	5.7	11.4	17.1	22.8	28.5	34.2	39.9	45.6	51.3
56	5.6	11.2	16.8	22.4	28.0	33.6	39.2	44.8	50.4
55	5.5	11.0	16.5	22.0	27.5	33.0	38.5	44.0	49.5
54	5.4	10.8	16.2	21.6	27.0	32.4	37.8	43.2	48.6
53	5.3	10.6	15.9	21.2	26.5	31.8	37.1	42.4	47.7
52	5.2	10.4	15.6	20.8	26.0	31.2	36.4	41.6	46.8
51	5.1	10.2	15.3	20.4	25.5	30.6	35.7	40.8	45.9
50	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0
49	4.9	9.8	14.7	19.6	24.5	29.4	34.3	39.2	44.1
48	4.8	9.6	14.4	19.2	24.0	28.8	33.6	38.4	43.2
47	4.7	9.4	14.1	18.8	23.5	28.2	32.9	37.6	42.3
46	4.6	9.2	13.8	18.4	23.0	27.6	32.2	36.8	41.4
45	4.5	9.0	13.5	18.0	22.5	27.0	31.5	36.0	40.5
44	4.4	8.8	13.2	17.6	22.0	26.4	30.8	35.2	39.6
43	4.3	8.6	12.9	17.2	21.5	25.8	30.1	34.4	38.7
42	4.2	8.4	12.6	16.8	21.0	25.2	29.4	33.6	37.8
41	4.1	8.2	12.3	16.4	20.5	24.6	28.7	32.8	36.9
40	4.0	8.0	12.0	16.0	20.0	24.0	28.0	32.0	36.0
39	3.9	7.8	11.7	15.6	19.5	23.4	27.3	31.2	35.1

MOST ECONOMICAL BETHLEHEM SHAPE TO USE AS A BEAM FOR A REQUIRED SECTION MODULUS

Section Modulus		Section Number	Weight per Foot, Pounds	Section Modulus		Section Number	Weight per Foot, Pounds
From	To			From	To		
4.8	6.4	BJ 6 x 11		201.8	222.1	B28 x 85	
6.5	11.2	BJ 8 x 14½		222.2	246.9	B28 x 91	
11.3	15.5	BJ10 x 16½		247.0	265.1	B28 x 97	
15.6	20.2	BJ12 x 18½		265.2	284.7	B28 x 104	
20.3	21.8	B 10 x 21		284.8	314.8	B30 x 110	
21.9	24.6	B 10 x 23½		314.9	330.8	B30 x 115	
24.7	31.2	B 12 x 25		330.9	351.3	B30 x 121	
31.3	35.6	B 12 x 28		351.4	395.1	B33 x 125	
35.7	42.5	B 14 x 30		395.2	422.3	B33 x 135	
42.6	47.8	B 14 x 33		422.4	449.4	B33 x 143	
47.9	55.1	B 16 x 35		449.5	503.4	B36 x 147	
55.2	59.7	B 15 x 38½		503.5	530.4	B36 x 155	
59.8	65.8	B 16 x 40		530.5	561.1	B36 x 164	
65.9	73.8	B 16 x 45		561.2	595.0	B36 x 173	
73.9	85.2	B 18 x 47		595.1	659.9	B36 x 190	
85.3	89.2	B 18 x 49		660.0	672.4	G33 x 200	
89.3	94.3	B 18 x 52		672.5	707.3	G33 x 210	
94.4	113.3	B 22 x 54½		707.4	741.4	G33 x 220	
113.4	124.7	B 22 x 58		741.5	778.0	G33 x 230	
124.8	135.9	B 22 x 62½		778.1	833.9	G36 x 230	
136.0	148.1	B 22 x 67½		834.0	872.0	G36 x 240	
148.2	163.7	B 24 x 70		872.1	911.2	G36 x 250	
163.8	175.7	B 24 x 73½		911.3	949.5	G36 x 260	
175.8	188.2	B 24 x 79½		949.6	1030.8	G36 x 280	
188.3	201.7	B 26 x 81		1030.9	1103.6	G36 x 300	

Beams to be secured against yielding sideways.

BETHLEHEM STEEL COMPANY

BETHLEHEM, PA.

PARTIAL LIST OF PRODUCTS

STRUCTURAL STEEL SHAPES: Bethlehem Beams, Joists and Stanchions; Rolled Girder Beams, Rolled Columns; Standard Beams, Channels and Angles; Standard and Special T and Z Bars; Plain and Fabricated; Crane Rails; Rolled Steel Slabs for Column Bases.

SHIPBUILDING SHAPES: Ship Channels, Bulb Angles, and Hatch Sections.

CAR BUILDING SHAPES: Beams, Channels, Angles, Bulb Angles, Z Bars, Center and Side Sill Sections, Belt Rail, Door Spreader, and Side Stake Sections.

PLATES: Universal and Sheared; Circular (Heads), in all grades for all purposes; Miscellaneous Pressed Work.

PILING: Lackawanna Steel Sheet Piling.

BRIDGES AND FABRICATED BUILDINGS: Designers, Builders, Fabricators and Erectors of all types of Bridges and Steel Structures. Buckle Plates.

RAILROAD TURNTABLES: Bethlehem Twin-Span Turntables; Balanced and Continuous Turntables.

FLANGED AND DISHED BOILER HEADS, SPECIAL FLANGED PRODUCTS.

AGRICULTURAL STEEL AND SPECIALTIES: Standard and Special Shapes.

AUXILIARY LOCOMOTIVES.

BARS AND BANDS: Muck Bar, Refined, Double Refined, Chain, Stay Bolt, Special Stay Bolt, Horseshoe and Engine Bolt Iron; Bessemer, Open Hearth, Electric and Alloy Steel; Concrete Reinforcing Bars.

BILLETS, BLOOMS, SLABS, SKELP AND SHEET BARS.

BOILER TUBES: Lap Welded; Charcoal Iron, and Steel.

BOLTS, NUTS, RIVETS, SPIKES, POLE LINE MATERIAL.

CARS: STEEL AND COMPOSITE FREIGHT, STEEL PASSENGER, MINE AND INDUSTRIAL.

CAR WHEELS: Rolled Steel.

CASTINGS: Steel, Iron, Brass and Bronze; Stainless Clad; Centrifugal.

COAL: Gas and Steaming.

ENGINES: Blowing, Producer Gas, and Gas.

FERRO-MANGANESE, SPIEGELEISEN, COKE AND COKE BY-PRODUCTS.

FORGINGS: Drop, Upsetter, Hammered and Hydraulically Pressed; All sizes and types; Forged Shafts.

GEARS AND PINIONS: Cut and Cast; Bridge Operating Machinery.

INDUSTRIAL AND MINE TRACK WORK, STEEL MINE AND INDUSTRIAL TIES.

INGOT MOULDS: All sizes.

MACHINERY: Hydraulic Machinery and Equipment; Special Machinery of all types and designs.

OIL BURNING SYSTEMS.

OIL REFINERY EQUIPMENT.

PIG IRON: Standard Grades, Special Grades, Mayari, Silvery Mayari.

PIPE AND TUBULAR GOODS: Lap and Butt-welded, Pipe, Casing and Tubing.

PULVERIZERS FOR COAL AND OTHER MATERIALS.

RAILS AND ACCESSORIES, FROGS AND SWITCHES. BETHCO RAIL ANCHORS.

ROLLED STEEL BLANKS FOR GEARS, PINIONS, FLY WHEELS, ETC.

ROLLS: Carbon and Alloy Steel.

SHEET AND TIN MILL PRODUCTS: ROLL ROOFING, RIDGE ROLL.

SPECIAL STEEL FOR AUTOMOBILE FORGINGS AND MACHINED PARTS.

STEEL AXLES: For Passenger and Freight Cars, Engine and Tender Trucks; Driving; Motor; Electric and Mine Car; etc.

TOOL STEEL, CARBON AND ALLOY: Bethlehem Special High-Speed Tool Steel; Non-shrinkable; Rock and Mine Drill Steel; Special Tool Steel; Small Tools, etc.

WIRE RODS, WIRE NAILS, WIRE, Woven Field and Poultry Fencing. Steel Fence Posts.

PLANTS AT

Bethlehem, Pa.; Lebanon, Pa.; Coatesville, Pa.; Johnstown, Pa.;
Steelton, Pa.; Lackawanna, N. Y.; Sparrows Point, Md.; Wilmington, Del.

BETHLEHEM STEEL COMPANY

General Offices

BETHLEHEM, PENNSYLVANIA

District Offices

New York	Cunard Building
Boston	Atlantic National Bank Building
Philadelphia	Widener Building
Baltimore	Continental Building
Washington, D. C.	Wilkins Building
Atlanta	Healey Building
Pittsburgh	Oliver Building
Buffalo	Marine Trust Building
Cleveland	Terminal Tower
Cincinnati	Union Trust Building
Detroit	New Penobscot Building
Chicago	People's Gas Building
St. Louis	Arcade Building
Houston	Post Dispatch Building

Pacific Coast Distributor

PACIFIC COAST STEEL CORPORATION

San Francisco	Matson Building
Los Angeles	Pacific Finance Building
Seattle	L. C. Smith Building
Portland, Ore.	American Bank Building
Honolulu	Castle and Cook Building

Export Distributor

BETHLEHEM STEEL EXPORT CORPORATION

25 BROADWAY, NEW YORK CITY

Printed in U.S.A.